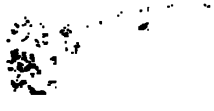
Treatise on Neuralgia.



THE FAIRCHILD PREPARATIONS

— OF —

THE PURE DIGESTIVE FERMENTS,

Active, Permanent and Reliable.

TRYPSIN

(FAIRCHILD)

Especially Prepared as a Solvent for Diphtheritic Membrane.

PEPTONISING TUBES.

(FAIRCHILD).

For the preparation of PEPTONIZED MILK and other predigested food for the sick.

PEPSINE IN SCALES.

(FAIRCHILD).

The most active, permanent and reliable pepsine made in the World.

ESSENCE OF PEPSINE

(FAIRCHILD).

For administration where a fluid and agreeable form of pepsine is desired, and for the preparation of Junket and Whey.

EXTRACTUM PANCREATIS.

(FAIRCHILD).

Containing all the digestive ferments of the Pancreas.

PEPTOGENIC MILK POWDER

(FAIRCHILD).

For the modification of cows' milk to the standard of Normal Mother's Milk.

PEPSINE IN POWDER.

(FAIRCHILD).

Prepared from the scales without the admixture of any other substances, to facilitate dispensing and the preparation of saccharated pepsine.

DIASTASIC ESSENCE OF PANCREAS.

(FAIRCHILD).

For the digestion of starchy foods.

FAIRCHILD BROS. & FOSTER,

82 AND 84 FULTON ST., NEW YORK.

A TREATISE

ON

NEURALGIA.

BY

E. P. HURD, M. D.,

Member of the Massachusetts Medical Society; Member of the Climatological Society; Member of the Societé de Médecine Pratique (Paris, France). One of the physicians to the Anna Jaques Hospital, Newburyport. Mass.

1890.
GEORGE S. DAVIS,
DETROIT, MICH.

B

DEDICATED

TO DUJARDIN-BEAUMETZ,

WHO HAS DONE SO MUCH TO ADVANCE THERAPEUTICS,

BY HIS FRIEND,

THE WRITER.

TABLE OF CONTENTS.

CHAPTER I.

GENERAL CONSIDERATIONS ON NEURALGIA.

Pain is a fact of consciousness, having for its invariable antecedent a disturbance of a sensory nerve or nerve-centre. Its seat is that part of the cerebral cortex known as the sensorium; the cause is generally an abnormal modification of some part of a nerve of sensation. The function of sensory nerves being to convey impressions to the sensorium,* when such impressions are abnormal in kind or in intensity, the phenomenon of pain may arise. One of the most common excitants of pain is inflammation, which causes compression of the nerves of a region and disturbance of their nutrition and function. Another cause is anæmia, or want of blood, for no pain is more intense than that which is experienced in a limb whose supply of blood is cut off by an arterial embolus. Tumors, foreign bodies as splinters, wounds or compression of nerves, also bring about those molecular changes in sensory conductors whose conscious expression is pain; and the same may be said of an inflammation confined to the sheath of the nerve itself. In fact,

* By the term *sensorium*, I understood with Robin, that portion of the encephalon which perceives, as distinguished from that which thinks, and from that which is endowed with motricity.

pain may be looked upon as a cry of danger, as an index of a destructive process somewhere going on in the organism.

Many kinds of pain have known pathological conditions for their substratum; the pain is the result of a phlegmon, a tumor, etc. This is not the case with the kind of pain of which we are here to treat, for neuralgia belongs to a class of nervous diseases known as *neuroses—i. e.*, which are functional or dynamic, not dependent on any gross anatomical lesion.

Neuralgia is a neurosis whose essential symptom consists in a lancinating pain, paroxysmal in character, described as boring, burning, stabbing, localized in particular nerve-trunks or their terminal branches; apyretic, without redness, without tension or apparent swelling; generally accompanied by secondary phenomena of a motor, vaso-motor, secretory, or trophic nature.*

Spring thinks that in order that the word *neuralgia* should be applicable to any particular case, there should exist two conditions: 1, the pain should be paroxysmal in character; 2, there should be no peripheral or central lesions present.†

Gowers would restrict the name neuralgia to the idiopathic class, and would exclude all forms (among

* The throbs of pain sometimes coincide with the arterial pulsations (Gowers.)

† Dujardin-Beaumetz, "Clinical Therapeutics," American ed., p. 51.

which he thinks sciatica generally belongs) which are the result of neuritis.

General Characteristics.—A general feature of neuralgic cases is the existence of anæmia and debility. Anstie insists on this condition of anæmia, or vital depression, as an invariable factor in neuralgia. The patient has been fatigued from overwork, physical or mental, or has gone through an exhausting illness. Prolonged suppurations, hæmorrhages, excessive venery, in fact debilitating influences of all kinds, may bring about the neuralgic diathesis.

One of the most severe and obstinate cases of *gastralgia* that I ever witnessed was in a young woman who, while nursing a robust infant, carried on the work of a large family while living on a meagre and quite insufficient diet.

Another characteristic is that exhaustion, from any cause, brings on an attack of pain. The victim of hemicrania, for instance, will have an attack after the fatigue of too long a walk, or a night's watching.

Another common feature of the neuralgias is the intermittence of the pain. The symptoms are paroxysmal in character: this is owing to the law of nervous exhaustion, for nervous actions are not continuous, but interrupted by periods of repose, due to exhaustion of the excitability, even when the excitement is persistent.*

---

* Jaccoud, Pathologie Interne. Vol. 1, p. 485.

In consequence of a fancied resemblance between the phenomena of neuralgic paroxysms and those of genuine intermittent, Van Swieten applies the name of *febris topica* to the former, and declares neuralgia to be only another manifestation of ague; with this view other ancient authorities coincide.* It is not an uncommon thing for a paroxysm of neuralgic pain to pass off after an hour or two of severity, leaving a state of perfect quiescence; oftener however, it must be confessed, a deep, contusive, fixed or diffuse pain remains till the next attack, which may come on in a few hours, or not till the sleep of the night is over. The resemblance to an access of intermittent fever, it must be confessed, is superficial and slight, but the paroxysmal character is none the less a fact.

Another event common to all the neuralgias is the occurrence of certain tender spots (*points douloureaux*) which are always found in neuralgias of a certain persistence and duration. These are called Valleix's painful points. These painful spots are generally situated at the point where a nerve trunk emerges from a bony foramen, or pierces the fascia of a muscle to be distributed to the skin. These spots are sometimes the centres of radiation of spontaneous pain; pressure upon them provokes very severe pain which may intensify the neuralgic attack.

Lastly, another peculiarity of neuralgias is their

---

*Rowland On Neuralgia. 1837.

generally unilateral character. This is so much emphasized by Anstie, that it forms a part of his definition.*

Clinical Description.—As a type of our description, we will take a case of facial neuralgia, known also as neuralgia of the fifth, or trigeminus. The patient may have been well up to the time of the attack; or, as is oftener the case, may have been depressed from cold, insomnia, overwork. Suddenly, or after certain premonitions, as nausea, chilliness, a sense of weight about the head, and a vague feeling of general discomfort—a circumscribed pain makes its appearance in some point of the face, or in one of its cavities. This pain, at first dull and contusive, soon becomes more intense, darts up and down one of the main trunks, and affects simultaneously numerous branches. The attack may consist of a continuous ache, or of a succession of violent twinges, with comparative ease in the intervals. In the height of the paroxysm, the pain seems to shoot into every nerve twig of the affected side, with predominance of aching in one particular spot where it first started. A peculiarity of the pain is that it manifests itself in a series of shocks more or less near together, though each series is separated by an appreciable interval; the sum of these series constitutes the attack. The

---

* Anstie, *Neuralgia and the Diseases that Resemble It*, New York, D. Appleton & Co., 1883.

duration of the paroxysm is from a quarter of an hour to an hour and a half; in one inveterate case, I have known the paroxysms to last all day, with only brief intervals between. The pain is increased and even awakened by a touch of the hand, while it is often the case that gentle rubbing, or even firm pressure over the affected part, produces alleviation.*

With the pain, there is frequently spasmodic twitching of the neighboring muscles, and sometimes rigid spasm. The existence of tetany in true neuralgia is denied by Vanlair, but it has been noted by other writers, and the writer saw a remarkable instance of contracture of the elevator muscles of the shoulder in a severe case of cervico-brachial neuralgia.†

Secondary phenomena of a vaso-motor kind, as flushing of the affected region, copious lachrymation from the neighboring eye, or running from the nostril on that side, are frequent accompaniments of the attack.

Pressure over Valleix's points is generally exceedingly painful; these, in trigeminal neuralgia, are at the supra-orbital and infra-orbital and mental foramina. Good observers, however, have failed to recognize these painful points in facial neuralgia.

* * * * * * * * *

---

* A short pressure is followed by exaggeration of the pain, a prolonged pressure, by diminution (Romberg). The continuous pressure interrupts conductibility.

† *Medical Record*, 1876, page 744.

The tactile sensibility of the skin is almost always diminished after a time in the neighborhood of the affected nerve. (Buzzard.)

The pain is very apt to radiate from the affected region to the nerves (sensory and motor) of neighboring regions. Thus, in trigeminal neuralgia, we may have pains in the posterior cervical region and the occiput, scapulo-clavicular, intercostal, and mammary regions. The motor irradiations consist in the clonic contractions (more rarely tonic) already alluded to; the muscles innervated by the facial nerve are convulsed. When facial neuralgia assumes this violent form, it is called *tic douleureux*. The convulsive shocks sometimes extend to the symmetrical muscles of the other side of the face, and even to the muscles of the trunk and limbs.

The attack of pain may pass off gradually, a dull aching and a soreness remaining for some time, or it may end suddenly, the patient passing, as by magic, from intense suffering to complete repose. The latter mode of termination is especially likely to follow a judicious anti-neuralgia treatment.

THE PATHOGENY OF NEURALGIA.

We know very little about the material alterations which attend neuralgia. We distinguish three phases in the operation of sensory nerves:

1. When the conduction is normal. Here the nerve conducts to the cerebrum impressions natural

in quantity and quality; the resulting sensations are pleasurable or indifferent. Such normal conduction is a necessary condition of that correspondence between the organism and its environment which enables the former to adjust itself to changes outside of itself. A stimulus (heat, cold, a touch, some chemical or mechanical irritant, etc.), produces a certain effect of a chemical, molecular kind, on the terminal filaments or trunk of a sensory nerve—this molecular change is propagated as a wave of motion to the cord and sensorium, where it produces the appropriate sensori-motor responses; there is a definite ratio between the stimulus and the effects engendered.

2. When the excitability is exaggerated; this state is called hyperæsthesia (excessive sensibility). The functional activity of the nerve is exalted from intensity of the excitation. When this hypersensibility reaches a certain degree it becomes pain, but this lasts no longer, or but little longer, than the excitation which has given rise to it. Instances of this functional hyperæsthesia are seen in all inflammations attended with pain.

3. When the conduction is abnormal; the resulting sensations are the consequence of a morbid irritability of the nerves and nerve centres. This form has been called by Jaccoud "spontaneous hyperæsthesia," and characterizes all the neuralgias, "A morbid hyperæsthesia raised to the potency of spontaneous

pain constitutes neuralgia." *The word *spontaneous*, as here used, "does not imply the absence of any cause capable of accounting for the anomalous state of the nerve; it indicates simply that this anomalous state is not linked to the exercise of the function of sensibility, as is the case with a pain occurring in connection with the inflammation of a part."

It is difficult to find illustrations which can make plain the difference between these several modes of conductibility, and the consequent state of consciousness.

If we place a number of marbles in a row, an impulse at the proximal end of the line will be transmitted to the distal end with a quality and intensity corresponding to the force communicated to the first marble of the series. We may suppose the molecules of a sensory nerve to be so arranged that an agitation at the peripheral end is similarly transmitted. Impacts beyond a certain intensity might produce at the central end a shock which would so disturb the sensorial centers as to give rise to the phenomenon of pain; and yet there would be a definite correspondence between these central molecular disturbances and the amounts of peripheral irritations. If we could imagine that each marble of that row was composed of something akin to *dynamite;* that there were irregular, fitful explosions all along the line from the most

---

* Jaccoud, *loc. cit.*

trifling causes, and that the quantity and intensity of the disturbance at the distal end bore no proportion to the force which started the disturbance, we might have, perhaps, a faint notion of the condition of the perturbed sensory nerves in a case of neuralgia. There certainly is no objection to the hypothesis—which alone explains the facts—that the protoplasmic molecules of certain portions of the sensory apparatus in neuralgic patients are in a state of peculiarly unstable equilibrium, at the least provocation falling to a lower plane and liberating force, which is propagated as a motor-wave to the central end; that such nerves are by this very instability and explosiveness ill-fitted for their ordinary functions of conductors of sensory impressions, while always predisposed to be the seats of violent attacks of spontaneous pain.

Writers have objected to the word *hyperæsthesia* as used in connection with the pain of neuralgia, and Vanlair has substituted the word *hyperalgesia*. If the former term may be supposed to mean *exalted function*, it is manifestly inappropriate; if *exalted irritability*, it is perfectly proper. It does not require a wide familiarity with various kinds of pain to convince one that where there is pain, there is increased excitability of a certain nerve or nerves; nor is it difficult, from personal experience, to recall instances where this hyperæsthesia, by the very fact of intensification, has run into pain, as in the sensory hyperæsthesia attending an

ophthalmia.* The pains from palpable organic causes imperceptibly shade into those properly regarded as neuralgic, and there is no absolute line of demarcation at the origin. All kinds of pain have for their direct antecedent, excessive molecular transformation, and all are markedly influenced by anæsthetics, by quiet, absence or removal of stimuli; in fact, some pains of an undoubted neuralgic character get well as soon as all periphereal excitations are removed.

* Gowers, in his treatise on neuralgia, lays emphasis on the argument by which definite nerve paths for pain, and consequently definite nerve centres for pain in the cerebrum are affirmed. Thus, tactile impressions pass up to the brain in the posterior columns, painful impressions and impressions of heat in the gray substance, as shown by experiments on animals and by clinical observations. In some instances (as cases of hysteria) there is conservation of the sense of touch and want of appreciation of pain. Chloroform abolishes pain while often in the anæsthesia of chloroform sensibility to touch remains. Then, again, there is the electric sense and the sense of tickling, which are modalities of the sense of touch, and which under some circumstances are abolished, while other forms of sensibility persist. Brown-Sequard has done much toward the demonstration if not mystification of this subject; among those who insist on definite specialization of nerve fibres and centres for the various modalities of sensation, we may mention Herzen, Magnus Blix, Donaldson, and Goldscheider.

It cannot, however, be said that there is yet anything like agreement among physiologists respecting this vexed question, and we find Vulpian maintaining to the last as the result of his experimentation the doctrine of "indifferent conductibility."

That pain is not something *special*, underived from and

The causes of neuralgic hyperæsthesia may be arranged in three orders*:

1. Intrinsic and primary modifications of the excitability of the nerve itself in some part of its tract from the gray nucleus of its origin to its terminal expansions.

2. Extrinsic lesions, which act directly, or indirectly by reflex action.

3. Constitutional states which modify the nervous excitability, generally by the intermediation of an alteration of the blood.

The first group contains the primary, or essential neuralgias; the other two groups, the secondary, called sympathetic or symptomatic neuralgias.

An example of primary idiopathic neuralgia is seen in face-ache (prosopalgia) from cold. Examples of neuralgia due to extrinsic lesions acting directly, are seen in attacks of prosopalgia starting in dental

---

separate from ordinary sensibility, is seen in the fact that there is no particular exciting agent productive of pain; the exaggeration of any kind of special sensibility may produce it;—too strong a light by affecting injuriously the retina, sounds too intense by violent agitation of the auditory nerve, thermic excitations carried to the extreme, intense cold, sufficient to produce disorganization of the tissues (Mathias Duval). Duval's definition of pain is a fairly good one: "Pain is constituted by a modality in the functionment of the centres, due to the fact that impressioning agents act in a violent, exaggerated manner, and inflict a perturbation on the organs of sensibility."

* Vide Jaccoud, *loc., cit.* article, *Nevralgie.*

caries, or a tumor involving a branch of the trigeminus; such lesions have been known to awaken neuralgic paroxysms indistinguishable from those of idiopathic prosopalgia. Illustrations of neuralgia from reflex causes are seen in trigeminal, cervicobrachial, or intercostal neuralgias, originating in ovaritis, or some other affection of a remote organ.

Examples under the third head are seen in neuralgias due to lead poisoning, mercurial poisoning, syphilis, or malaria. The neuralgias accompanying anæmia and chlorosis are also generally classed under this head, being due to blood depravement.

Is it possible, from the knowledge which physiology gives us of the constitution of nerves, to come any nearer to an understanding of the phenomena which take place in neuralgia?

The conductibility of nerves is a property inherent in the axis cylinder, which is the central core of the nerve, and is composed of protoplasm. The ultimate peripheral termination of sensory nerves is the naked cylinder. On these protoplasmic filaments, which in many parts of the body terminate in sundry appliances (Paccinian corpuscles) which are "multipliers of disturbance," and have the function of concentrating on the nerve ends the action of external agents, come a multitude of impressions from the outer world, from the tissues in which these nerves ramify, and from the circulating blood. What is the

kind of change which is produced when an impression, as of contact, of heat, or of cold, is made on these sensory filaments? The only tenable supposition is, that a wave of molecular disturbance—akin to the modification in a telegraph wire when a message is sent—is instantly propagated the whole length of the nerve to its central nucleus. In the normal state a nerve apparatus which is the seat of such changes, not inaptly called "isomeric transformations," speedily reintegrates itself from the circulating blood, and the disturbance does not exceed the healthy mean; there is no pain. How is it, when from natural or acquired instability of the nerves, there is too much molecular transformation?

Herbert Spencer remarks that "the (peripheral) afferent nerves of individuals who, though otherwise healthy, have lax tissues, are often unduly impressible." Other causes besides "lax tissues" may produce this excess of impressibility. It may accompany vaso-motor weakness and congestion, for local excess of the blood is attended with local exaltation of sensibility. We have to note, also, the seemingly anomalous fact that local deficiency of blood, as in anæmia, renders the nerves abnormally impressible. Ordinary excitants are capable of producing an extraordinary amount of molecular change. Cold, which is one of the normal excitants, may, by its prolongation or intensity, bring about that excessive transformation

which finds expression in a neuralgic paroxysm.* A mental shock, a physical injury, even a decayed tooth, may start a disturbance in certain nerve branches which, not being repressed by the higher nervous energies—co-ordination being weakened or broken—soon amounts to a riot in the organism; the central sensory centres are fatigued, overcome, charged with the products of disintegration, and brought to that state of molecular disorder which constitutes *algesia*,† and whose conscious expression is pain.

---

* The *modus operandi* of cold may be thus explained. "It exerts a depressing influence on the nervous centres in general. The superficial layers of the blood are cooled; this occurs the more easily when the stimulus of chilly air is not sufficiently sharp and sudden to cause a firm contraction of the cutaneous vessels, while the moisture rapidly absorbs the heat of the blood. From this result indirectly various disorders of nutrition of the deeper-lying tissues or distant organs, and among these, congestion and neuritis of the sensory nerves."—(Putnam‡).

‡ Pepper's Syst. of Med., vol. v., p. 1219.

† A term coined by Vanlair to denote the state of the central nerve cells whose manifestation is pain. According to this writer, there are special groups of cells—not cells of special sensation or general sensibility,—whose function is *algesia;* they are set apart for pain and nothing else. It must be confessed that Vanlair gives weighty arguments in support of this view. And yet I cannot believe that there are nerve centres whose sole function is the elaboration of painful sensations. In the healthy, normal state, these cells would have no office, and might be expected to atrophy. More reasonable is the doctrine

But it will not do to lose sight of the fact that neuralgia may begin centrally as well as peripherally, in a lowered state of nutrition, and in resulting dynamic perturbation of the central gray nucleus itself. The pain would be, as it were, projected on the nerves whose nucleus is diseased. Such neuralgias are exceptions.

The above conception—instability of the ultimate nerve elements, broken coördination, brings neuralgia into harmony with the other neuroses, epilepsy, hysteria, chorea, etc.

The intermittency of pain is a consequence of the intermittent character of nerve action. "If," says Herbert Spencer, "a nervous disturbance travels as a wave of molecular change; if this wave is such that the molecules of nerve substance fall from one of their

---

that pain is only a modification of common sensibility and is a property of protoplasm under certain conditions of disturbance. Pain is the suffering of the living element wherever that element exists. And yet there must be superadded a factor without which our conception of pain is incomplete; that factor is *consciousness*.

It is not known just where consciousness is located—probably its zone occupies the entire cortex cerebri; but just there where the nerves of common sensibility terminate in the conscious zone, is the seat of pain.

We do not know enough about the material correlatives of conscious states in general to warrant us in affirming that pain is not a property of cortical cells whose ordinary function, under normal conditions of nutrition and stimulation, is the elaboration of sensations, pleasurable and indifferent,

isomeric states to the other; then, having fallen, in passing on and increasing the shock, they remain incapable of doing anything more until they have resumed their previous isomeric state."

But how may we account for the peculiar character of neuralgic pains? The pain of a neuralgic paroxysm is something different from that of abscess in an otherwise healthy individual, or the pain of pleurisy. The pain of neuralgia may be decomposed into a permanent pain, and, at certain moments, aggravations of this pain, of the nature of spontaneous recrudescences. Moreover, the neuralgic suffering is attended with painful irradiations into neighboring nerves of the same branch, and subsequently into other nerve trunks and their branches.

The explanation must be sought in the constitutional state of the subject whose neuro-mechanism is in the peculiar condition of instability and impressibility before alluded to,—responding to irritants in a fitful, disorderly, and excessive manner; then, for a brief time becoming exhausted till sufficient material has been assimilated for another series of discharges. The phenomenon of diffusion and irradiation is accounted for by the intensity and *quantity* of the molecular motion liberated—waves from one set of nerves being reflected upon other sets of nerves. According to this view, the phenomenon is one of peripheral transfer—of simple overflow. Erb, however, has another explanation. In these cases of irradiation, we have to do with a transfer of the excitation from the central

cells to other cells also central, but corresponding to other nerve branches, and the sensation is referred to the periphery of the latter in virtue of the law of eccentricity. But it would seem that this explanation, as well as that before given of peripheral transfer, is not so applicable to painful irradiations as to simple diffusion of pain. Perhaps the explanation given by Vanlair may be deemed the most satisfactory. Every nerve of sensation exchanges recurrent filaments with the neighboring branches. In an algesic condition, the recurrent filaments may be spared, if the excitation does not exceed a certain degree of intensity. If, however, the excitation becomes too vehement, the cells of the recurrent system of nerves will take on in their turn the algesic state, to become quiet again when the hyper-excitation shall have ceased.

A similar use is made of these recurrent filaments in explaining the *points douloureaux*. These filaments lose themselves suddenly in the tissues surrounding the nerves in the vicinity of a foramen of emergence, subcutaneous tissue, periosteum, neurilemma. If the recurrent filaments become the seat of a neuralgic process, the least pressure exercised on the tissues in question, or even the normal tension of the parenchymata or of the blood, will always affect, in an algesic sense, a part of the fibres which form this sort of terminal tuft. The impression will be transmitted to the central cells, and these, by virtue of the law of eccentricity, will refer the painful sensation to the periphery, to the very point irritated.

CHAPTER II.

CLASSIFICATION OF THE NEURALGIAS.*

The first general division comprehends two great classes; idiopathic and symptomatic neuralgia.

Idiopathic or essential neuralgia develops spontaneously, or under the influence of an excitating cause, but independently of any general morbid state, actual or pre-existent or known organic cause.

Symptomatic neuralgia is dependent on the existence of a known organic cause, or general morbid state.

Idiopathic neuralgias, from the point of view of their cause, are not susceptible of any division. Symptomatic neuralgias naturally fall under two categories; in the first are placed neuralgias due to the general state (holopathic neuralgias); in the second, those which depend on a localized morbid state.

The general morbid state may be: 1, inherent in the organism (inherited or acquired) or 2, the result of some poison introduced into the economy.

As instances of neuralgias dependent on a general morbid state apart from ordinary chemical poisons, we have gouty, hysterical, syphilitic, diphther-

---

***I have closely followed Vanlair's classification in this chapter. Many of these divisions are destined to be abandoned as wider knowledge is gained of the organic causes of pain.**

itic, chlorotic, diabetic neuralgias, those which follow fevers and other acute diseases, and such as supervene in consequence of the suppression of an habitual discharge.

As examples of neuralgia caused by a poison, we have lead (or painters') colic, alcoholic neuralgia, neuralgia from abuse of tobacco, or from mercury.

The localized morbid state may be more or less distant from the seat of pain. Sometimes the distance is considerable; here the neuralgia is called sympathetic, or reflex. Lesions directly affecting the nerve itself, or the tissue surrounding it, do not give rise to true neuralgia, but to simple neuralgiform pains, or *pseudo-neuralgia*.

From the point of view of their seat, whether they be idiopathic or symptomatic, neuralgias are of two kinds: 1, neuralgias of the cerebro-spinal system; 2, neuralgias of the ganglionic system.

The pain may occupy the nerve trunks or their peripheral extremities (muscles and teguments) or the nerve centres.

Hence we might make another division with three clases, *ramicular* neuralgias, or common neuralgias, muscular and tegumentary neuralgias, and central neuralgias. The tegumentary neuralgias are cutaneous or mucous, and the central neuralgias affect the cerebro-spinal axis, or the ganglia of the sympathetic. The visceral neuralgias belong to the latter.

TABLEAU OF THE NEURALGIAS (FROM VANLAIR.)

FIRST CLASS OR IDIOPATHIC NEURALGIAS.

I. Cerebro-spinal Nerves.

A. Ramicular nerves, or the neuralgias properly so-called.

1. N. Trifacial. (Prosopalgia.)
   - Ophthalmic Branch.
     - N. Supra-orbital.
     - N. Frontal-palpebro-nasal.
     - N. Bulbar or Ciliary, —dural.
   - Sup. max-Branch.
     - N. Infra-orbital.
     - N. Superior-dental.
     - N. Naso-palatine.
   - Inferior Maxillary Branch.
     - N. Anterior auricular.
     - N. Temporal.
     - N. Buccal.
     - N. Lingual.
     - N. Inferior dental.
     - N. Mental.
2. Facial nerve properly so-called. The seventh pair.
3. Nerves of the Cervical Plexus.
   - N. Occipital.
   - N. Mastoid.
   - N. Anterior cervical.
   - N. Supra-clavicular.
4. Nerves of Brachial Plexus
   - N. Circumflex.
   - N. Supra-scapular.
   - N. Ulnar.
   - N. Radial.
   - N. Median.
   - N. Musculo-cutaneous
5. Diaphragmitic nerves (?)
6. Dorso-intercostal Nerves.
   - N. Dorsal.
   - N. Intercostal.
   - N. Mammary.
7. Nerves of Lumbar Plexus.
   - N. Lumbar.
   - N. Hypogastric.
   - N. Ileo-inguinal.
   - N. Scrotal or labial.
   - N. Crural.
   - N. Obturator.
8. Nerves of Sacral Plexus.
   - N. Sciatic.
   - N. Anal.
   - N. Perineal.
   - N. Penile.
9. Nerves of the Coccygeal Plexus (Coccygodinia.)

TABLEAU OF THE NEURALGIAS (CONTINUED.)

FIRST CLASS OR IDIOPATHIC NEURALGIAS.

I. Cerebro-spinal Nerves.

- B. Muscular nerves, or myalgia.
- C. Cutaneous nerves, or dermalgia.
- D. Central nerves. { Cerebralgia. / Spinalgia.

II. Ganglionic Nerves or Visceralgia.

- Nerves of the Pharynx.
- Nerves of the Œsophagus.
- Nerves of the Larynx.
- Nerves of the Lungs.
- Nerves of the Heart.
- Nerves of the Stomach.
- Nerves of the Intestines.
- Nerves of the Liver.
- Nerves of the Spleen.
- Nerves of the Kidneys.
- Nerves of the Bladder.
- Nerves of the Uterus.
- Nerves of the Ovaries.
- Nerves of the Testicle.
- Nerves of the Vagina.

TABLEAU OF THE NEURALGIAS, CONTINUED.

SECOND CLASS SYMPTOMATIC NEURALGIAS.

- I. Neuralgias linked to a general morbid state. (Holopathic neuralgias).
  - A. Neuralgias of organic cause.
    - Neuralgia, hysterical.
    - " epileptic.
    - " hypochondrial.
    - " arthritic.
    - " gouty.
    - " hepatic.
    - " scrofulous.
    - " syphilitic.
    - " chlorotic.
    - " diabetic.
    - " albuminuric.
    - " zymotic (diphtheria, typhus, etc.).
    - " metastatic (from suppression of menses, a cutaneous eruption, a pulmonary catarrh, etc.).
  - B. Neuralgias of toxic origin.
    - Neuralgia, saturnine.
    - " arsenical.
    - " mercurial.
    - " narcotic.
    - " alcoholic.
    - " malarial.
    - " pellagrous.
    - " ergotic.
- II. Neuralgias linked to a localized morbid state.
  - A. In a point remote from the seat of the pain (sympathetic or reflex neuralgias).
    - Neuralgia, cervico-brachial, due to disease of the liver, bladder, etc.
    - " intercostal, and gastralgia, dependent on uterine lesion, etc.
    - " facial, due to gastric or intestinal disorders, helminthi, etc.
    - " sciatic, caused by blenorrhagic epididymitis.
  - B. In the painful focus itself. (Pseudo-neuralgias.)
    - Following a surgical or accidental traumatism, a neoplastic growth (neuroma, carcinoma, sarcoma, etc.), an inflammation not traumatic, etc.

CHAPTER III.

THE CAUSES OF NEURALGIA.

First among the predisposing causes is heredity. Since Morel and Moreau laid the foundations of the doctrine of hereditary neuroses, all authorities have recognized the influence of the neuropathic predisposition in the genesis of neuralgia. The neuralgic subject will be often found to have inherited in the direct family line the particular weakness of nerve organization which finds expression in the paroxysmal attacks from which he suffers.

Nothing, moreover, has been more clearly demonstrated than the fact of the interchangeability of the various neuroses. The victim of neuralgia may have had an hysterical or an epileptic mother, or an insane father or grandfather; the neuropathic tendency was transmitted, and circumstances have determined what neurosis should manifest itself.

It would appear, also, that the neurotic temperament is largely akin to the phthisical. Many writers (and especially Anstie) have shown the interchangeability of various functional nervous diseases with pulmonary consumption. The neuropathic patient has had a phthisical parent; the child, after suffering for a series of years from some nervous malady—epilepsy, hysteria, neuralgia—ultimately dies of phthises. An-

stie's tables bring this fact clearly to view; I have myself seen frequent confirmation of it.*

As for *age*, the extremes of life have a relative immunity from neuralgia. Out of 296 cases, Valleix met with but 5 cases of neuralgia in subjects between seventy and cighty years, while there were but 2 cases in children nnder ten years. The maximum of cases (68) was between twenty and thirty.

There are, however, more cases in advanced life than statistics appear to show, the number of aged persons in any community being relatively limited as contrasted with that of adults. Anstie affirms that the period of declining life is preëminently the time for severe and intractable neuralgias. Neuralgia in the aged is associated with degenerative changes in the arteries, and general mal-nutrition.

The middle period of life is the period of toil and care. Men are absorbed in the pursuit of business and in the support of their families; the rich and the idle are immersed in dissipation, which, no less surely than exhaustive toil, saps the vitality; with women, this is the term of child-bearing, the rearing of fami lies, and household drudgery. Middle age brings with it high resolves, great undertakings, and fierce

---

*See in this connection Chapter III. in Anstie's book on Neuralgia; also Maudsley "On the Pathology of the Mind," p. 87 *et seq*,; Blandford, "Lectures on Insanity," chapter on Causation.

competition; but it also brings with it disappointed hopes, *ennui*, and weariness—all the moral and physical conditions of nerve-tire and nerve-ache.

Sex does not appear to have an important predisposing influence on the frequency of neuralgia in general. According to Putnam,* if women show a stronger predisposition than men to certain forms of neuralgia, as to the other neuroses, it is generally conceded that, whereas neuralgias of the fifth and occipital and of the intercostal nerves are met with oftenest amoug them, the brachial, crural and sciatic neuralgias more commonly occur among men. This, he thinks, indicates that the neurosal element is of greater weight in the former group, the neuritic element in the latter.

The sexual periods of life have a recognized influence in the production of neuralgia. The physiological processes connected with the development of the reproductive organs in the male, with ovulation and menstruation, gestation and puerperality, and the menopause in the female, are attended with the expenditure of enormous nutritive and nervous energy, and predispose to neuralgic affections. The premature, excessive, or unnatural exercise of these organs and functions depresses the organism and favors the development of the neuropathic diathesis.

---

*Article *Neuralgia* in Pepper's System of American Medicine.

*Previous diseases** predispose to neuralgia by the debility and anæmia which they occasion; the same may be said of *unhealthy hygienic influences* such as bad air, and insufficient food. *Cold and damp weather* has an influence; neuralgias are more prevalent in this country in the fall and spring months. *General disturbances of nutrition*, and especially those included under the names anæmia and chlorosis, and all cachetic states, such as cancer, tuberculosis, scurvy, diabetes, may be regarded as important conditions in the etiology of this disease.

EXCITING CAUSES.

It is not always possible to find for idiopathic neuralgia any exciting cause. Yet generally a minute inquiry will bring out the fact that there had been previous exposure to cold and wet, excessive muscular exertion, inordinate sensorial fatigue, or some moral shock, as the immediate antecedent. Wounds of sensory nerves, contusions, gun-shot wounds, punctures, and other injuries, have caused most obstinate and distressing neuralgias. Even comparatively slight injuries to small sensory nerves, as by venesection, a subcutaneous injection, have resulted in neuralgiform pains or attacks of genuine neuralgia. Erb supposes all these injuries to act "either by occasioning inflam-

*I have seen very obstinate neuralgias follow typhoid fever. One very severe case of gastralgia that came under my observation was the sequel of an exhausting accouchement.

matory changes (neuritis), or by forming tumors on the nerves (traumatic neuromata, amongst which the neuromata following amputation are the most frequent causes of severe neuralgia), or lastly, purely mechanically, by pressure and laceration in consequence of the retention of foreign bodies in the wound." *

Dr. S. Weir Mitchell, in his book "On Injuries of the Nerves," has narrated many remarkable instances of neuralgia starting from gun-shot or other wounds of the nerves, and cases are on record where a fall on a member has developed neuralgia of the sensory nerves of the limb.†

Many of these cases do not seem to be true neuralgias, in fact, all traumatic neuralgias are classed by some authors (as Vanlair) apart, under the head of *pseudo-neuralgias.*‡ These neuralgias have a marked resemblance to ordinary neuralgias; sometimes, however, they are distinguished from the latter by their

---

* Ziemssen's Cyclop., vol. xi, p. 28.

† One of the most intractable neuralgias I have ever witnessed involved the brachial plexus, and was brought on by a fall on the shoulder in a runaway accident. Considerable atrophy of the muscles of the corresponding limb followed. I have seen, in very sensitive persons, neuralgia succeed a hypodermic injection, paroxysmal pain appearing at intervals daily for several days.

‡ Vanlair, *Les Nevralgies, leurs formes et leur traitement,* 2d ed. (Bruxelles, 1882.)

extraordinary violence and obstinacy. Sometimes the pain is of a burning character, at others, lancinating (stabs or darts); it may remain localized to the region, or may be of a spreading character. Trophic disturbances sooner or later follow, which affect particularly the skin; the red, thin, and shiny skin known as *glossy skin*, is one of the effects of traumatic neuralgias of the extremities.

Closely resembling traumatism in its action on nerves, are those diseases of the periosteum and bones which by mechanically irritating and disordering nerves in the neighborhood, occasion neuralgia. The fifth nerve is especially liable to such lesions, having to pass through a long narrow bony canal, any periosteal thickening of which cannot but seriously affect its structural and functional integrity. Syphilitic ostitis and periostitis have been reckoned among the causes; it is doubtful whether these can cause true neuralgia. Syphilis may produce neuralgia by depressing the general health and tone—this disease is, however, much more likely to cause motor affections (as paralysis), than sensory. *

That cold, and especially damp cold, is an important factor in the production of neuralgia, no one with much experience in the various forms of this neurosis will dispute. In fact, persons predisposed to neuralgic affections are almost certain to suffer either

---

* Anstie, *loc. cit.* (Am. ed.), p. 175.

a renewal or an aggravation of their complaints after being chilled.

A special chapter will be devoted to the reflex and sympathetic neuralgias which are due to organic causes more or less distant from the seat of pain, and to the toxic neuralgias which result from mal-nutrition of the sensory nerve system by chronic poisoning.

Among other causes of neuralgia, must be mentioned the fatty and atheromatous changes in the tissues and arteries consequent on old age, overwork of body and mind,* and diseases of the central nervous system, as hyperæmia, inflammation, and tumors of the brain and spinal cord.

*** Many severe cases of facial neuralgia are caused by eye-strain, as by reading too long, and before too bright a light.**

CHAPTER IV.

PARTICULAR FORMS OF NEURALGIA.

I. FACIAL NEURALGIA.

This disease has been called prosopalgia, neuralgia of the fifth, trigeminal neuralgia, and *tic douloureux*. It is one of the most frequent of neuralgias; this is explained by the relations of its branches to various important organs, the disturbances of which may extend to the nerves supplying them, and by the fact that the face is more exposed than other parts of the body to cold and injurious influences.

This affection is generally unilateral. As the fifth nerve divides on emerging from the cranium into three nerve trunks, the ophthalmic, the superior maxillary and the inferior maxillary, any one of these branches may be the seat of the neuralgia. Commonly, however, it occupies the entire trifacial nerve. As causes, the following have been enumerated: "Cold, decayed teeth, contusions and wounds of the face, compression of the nerves by foreign bodies, neuromata, tumors of the petrous bone, aneurisms of the internal carotid, tumor of the pons, fungus of the dura mater." All the predisposing and exciting causes before enumerated may be factors in the genesis of this neuralgia. Diseases of the nasal and

frontal sinuses, and fatigue of the eyes, shock and mental emotion, have been occasional causes.

The paroxysm may come on suddenly or gradually. It generally begins with a sensation of heat or cold over the affected parts with occasional violent strokes of darting pain, which become more and more frequent till the attack is at its height.

Probably no more atrocious suffering is known. "During the attack, the patients utter loud outcries, toss about on their beds and smite their heads;* the muscles of the affected side of the face are often the seat of rapid contraction,—convulsive shocks, which have gived to this disease one of the names by which it is known—*tic douloureux*. These contractions may be limited to single groups of muscles, as the zygomaticæ, or the frontal part of the occipito-frontalis. The face becomes turgescent; there is often photophobia, lachrymation, buzzings in the ears; then the paroxysmal shocks diminish in frequency and intensity, and all becomes calm; the storm has passed, to be renewed again under the same form in a time not far distant.

According to the branches affected, certain phenomena present themselves: photophobia, injection of the eyes, lachrymation, transient amaurosis in neuralgia of the ophthalmic, odontalgia, pituitary secretion

* "In neuralgias about the head, the patient will often be seen to cringe and recede before the plunges of pain as though he were receiving blows." Buzzard.

in neuralgia of the superior maxillary, painful deglutition and mastication, exaggerated salivary secretion in neuralgia of the inferior maxillary nerve."*

Valleix's painful points are: 1, supra-orbital, over supra-orbital foramen; 2, palpebral; 3, nasal (internal and superior part of nose;) 4, ocular; 5, infra-orbital (infra-orbital foramen); 6, molar; 7, superior dental; 8, superior labial; 9, palatine; 10, temporal; 11, temporo-maxillary; 13, mental (mental foramen); 14, lingual; 15, inferior labial.

Putnam (*loc. cit.*, 1232) makes three varieties of facial neuralgia: 1, ordinary facial neuralgia, analogous to the neuralgias of the other superficial nerves; 2, intermittent supra-orbital neuralgia, sometimes called brow-ague, though by no means always of malarial origin; 3, epileptiform neuralgia (tic douloureux). The first, or ordinary facial neuralgia, is painful and obstinate, though not so serious as tic douloureux. It is often due to decayed teeth, and diseases of the gums or of the alveolar process. The second, or intermittent form, has one variety which bears a certain relationship to migraine, occurs in distinctly neuropathic individuals and families, and in attacks of about the same duration and periodicity of occurrence. Another variety is characterized by a daily seizure which occurs with absolute regularity, coming on usually about nine in the morning, and

---

* *Vide* "Clinical Therapeutics," p. 76 (foot note).

increasing in severity for an hour or so, then persisting unchanged till midday or later, when it gradually diminishes, finally disappearing in the course of the afternoon. As a rule, Putnam says, is is brought on by catarrh of the frontal sinuses, often following an acute attack of coryza. This form is greatly controlled by quinine (15, 20 to 25, and even 30 grains) four hours before the attack. The epileptiform variety (tic douloureux) is characterized by the suddenness of its onset, and the severity of its paroxysmal pain. The path pursued by the darts of pain is generally in the direction of the nerve-tracks. According to Putnam's view above given, the name *tic douloureux* is only applicable to the disease when it appears in its more painful character.

Treatment.—Only the surgical treatment will be here mentioned. The medicinal treatment will be discussed in the chapter devoted to general therapeutics.

In 1851 Dr. J. M. Carnochan operated in the first case for complete resection of the second branch of the fifth pair from the foramen rotundum to the infra-orbital foramen—with the removal of Meckel's ganglion—with complete success. Simple subcutaneous section of the infra-orbital nerve in the cheek had been often done before that time, but with no very encouraging results; in fact, the relief coming from the operation was very temporary.

The operation is a bold one, and involves trephining the antrum.

Dr. Robert Abbe, of New York, has lately published in the *New York Medical Journal* reports of a series of cases in which he has performed Carnochan's operation with brilliant success.*

II. MIGRAINE, ITS PATHOLOGY AND TREATMENT.†

According to Anstie, migraine (hemicrania) is a variety of neuralgia of the ophthalmic division of the fifth nerve. He remarks that the attacks of migraine often interchange with neuralgia seizures; that they often begin with pain distinctly located in the supra-orbital nerve, as the result of exposure to cold or other of the causes of ordinary neuralgia. This view is favored by Senkler in "Pepper's System of Medicine."

Romberg regarded migraine as a neuralgia of the cerebrum, but Hesse observes that the symptoms of this neurosis are equally compatible with its location in the branches of the fifth distributed to the meninges and bones of the cranium.

There is, however, much to be said in defence of the view that migraine is primarily a neurosis of the sympathetic nerve. According to Du Bois-Reymond, the phenomena of migraine are best explained by the

---

* *Vide New York Medical Journal*, Aug. 3d, 1889.

† In this section, as in one or two other instances (*vide angina pectoris*), the writer has availed himself of articles of his own which have appeared in the Boston *Medical and Surgical Journal* and *Medical Age*.

supposition that there is abnormal excitation of the sympathetic on the affected side, and he emphasizes in this connection the retraction of the temporal artery, the pallor of the countenance, the dilatation of the pupil; all of which are due to tonic contraction of the vascular and oculo-pupillary muscles.

But, as Jaccoud remarks, the constancy of these phenomena has not been established, and Moellendorff afterwards maintained a directly contrary view, to wit, that the symptoms of hemicrania depend on the unilateral relaxation of the vessels of the head, from want of energy of the vaso-motor nerves. Eulenburg* adopts an intermediate theory, affirming that a certain class of cases is undoubtedly vaso-motor in its origin. He describes two types of migraine: the sympathetico-tonic or angio-spastic, and the angio-paralytic or neuro-paralytic forms. In the one, the face is pale and sunken; in the other, it is hot, turgid and flushed during the height of the attack. In the one, the pupil is dilated and the temporal artery appears as a hard cord; in the other, the pupil is contracted, and the temporal artery is swollen and throbs with increased force. In the one, the eyes are pale and sunken; in the other, they are suffused and prominent.

Jaccoud reconciles the pathological differences above mentioned by assuming that there cannot be two vascular conditions so contradictory, as the sub-

---

*Ziemssen's Cyclop. Art. Hemicrania.

stratum of migraine. If, he says, clinicians have witnessed opposite phenomena, it is simply because they observed at different periods; in other words, the paroxysm of migraine is constituted by an abnormal excitation of the sympathetic followed by a paralysis by exhaustion, which marks the decline and the termination of the paroxysm. The contraction of the vessels during the onset and the active period of the attack explains why the pain is exaggerated at each pulsation of the artery; as for the origin of this pain, it may be attributed to the vascular cramp itself, which compresses the nerve filaments contained in the unstriped muscles.*

Hemicrania is a disease from which no station or condition of life is exempt. Rich and poor, the man of ease and the fashionable lady, the mill-operative and the kitchen drudge, are alike subject to migraine. Among the factors in its production, hereditary predispostion is the most potent. The disease follows the female line, being usually inherited from the mother only, and by the daughters only (Eulenburg). When there is a strong hereditary tendency, girls of quite a young age may be attacked by migraine, Eulenburg has known girls of four or five years to be sufferers.

In half the women affected with migraine, the attacks occur at the menstrual period or immediately

---

* Jaccoud: Path. Interne, t. i, p. 478.

after. In other cases, the attacks are due to mental excitement, after attendance at a party, at a theatre, etc. Sometimes the attack is provoked by reading and study; some persons have hemicrania from reading by artificial light. The attacks sometimes appear to originate in indigestion.

It is in this form of neuralgia that the recently discovered analgesics, antipyrin, acetanilide, phenacetin, exalgin, seem to do the most good. Here the triumph of guarana and caffein is often seen. When the attack can be traced to the stomach, ipecacuanha in one-fourth grain doses every hour has been commended, also rhubarb and soda, or some of the effervescing aperients.

In the angio-spastic variety, nitrite of amyl inhalations, and nitro-glycerin by mouth, have been beneficial. In the angio-paralytic form, ergot has been found useful.

Senkler speaks favorably of bromide of lithium, fifteen grains every hour for two or three doses. The effervescent bromide of caffein, or bromo-pyrin, is a good preparation. Seguin's favorite treatment is cannabis indica, one-fourth grain doses of the alcoholic extract three times a day, to be continued for weeks and even months. Aconitia (one two-hundredth grain) and gelsemium have been praised; the former is, perhaps, one of the most certain remedies in the angio-spastic variety. Malarious forms are speedily benefited by large doses of quinine. Always,

as prophylactic treatment, arsenic and cod-liver oil are indicated.

Anstie and Eulenburg think well of galvanism to the head and sympathetic. Firm pressure on the head and compression of the carotids sometimes give relief; the same may be said of sinapisms to the nape of the neck, and the application of a hot-water bag to the back of the head.

After all, resort must sometimes be had to hypodermic morphia in the atrocious suffering of migraine.

Migraine, says Lasègue (Etudes Medicales, vol. II., p. 331), is a disease of paroxysms; a man who suffers from continuous headache is not migrainous. The attacks do not repeat themselves at periods that can be mathemetically calculated. * * * * * Ordinarily, the attacks do not recur oftener than once a week. On the other hand, he who has only one or two attacks a year, cannot be said to be a victim of true migraine. * * *

The duration of the attack also obeys positive laws. Any attack of cephalalgia which lasts less than six hours and more than forty-eight hours, cannot properly be called migraine. Typical migraine appears in the morning. After certain prodromes: physical and mental atony with diminution of appetite, pallor, fatigue, the headache begins with a diffused sensation of cranial tension, sometimes by a pain in one spot, which spreads over the cranium and face of the affected side, never limiting itself to a nerve tract.

Topographically, migraine is hemicranial, occipital, syncipital, or diffuse; in the first case it has its maximum of intensity in the orbit, in the infra-orbital and temporal regions, never fixing itself below the infra-orbital line; at the most there

is a vague sensation of weight and swelling of the face and a little aching of the teeth. The occipital form is the most painful, and is rarely hemicranial; the syncipital, never.

Migraine is exceptionally diffuse at first; starting from one or more points, it spreads with rapidity to the entire cranial surface, without having everywhere an equal intensity. Patients affirm that the skin seems to be detached, as though they were being scalped. Sometimes, however, the integument seems to adhere to the skull by a violent retraction; the patients complain of being tortured by a leaden cap, or by an iron band. Intolerable as the pain is, it is rather contunding than lancinating, and seems to the patient rather *extra* than *intra* cranial.

In proportion as the paroxysm advances towards its acme, the sufferings become ordinarily more confused, probably by reason of the general malaise which becomes more pronounced; sometimes, however, the pains change their place, redoubling their intensity. This sudden migration of the pain during the attack is a remarkable fact which differentiates migraine from the ordinary neuralgias; sometimes, for instance, the pain suddenly shifts from the left to the right side, or vice versa.

To the pericranial sufferings are soon conjoined certain ailments connected with the stomach which have given to migraine one of its names, *sick-headache*. There is nausea, retching, and vomiting during the attack; these symptoms predominate in the stationary period and then sometimes cut short the attack, though at the onset vomiting does not relieve.

It may be affirmed that no attack of headache not accompanied by gastric complications is true migraine.

In the third period the violent pain is decreased, and the nausea much less pronounced. The head becomes heavy; it seems at times as if it were enormously swollen; the pain through the eyes is more pronounced, though vision may be unaffected. The first manifestations of a cerebral kind are *in-*

tellectual torpor with absence of ideas, or a sub-delirium similar to that of dreams, though the patient can still control himself. The necessity of sleep is now felt, and the patient gladly yields to it; a delicious slumber closes the attack; the patient wakes with a feeling of prostration, though free from pain; he is not himself again until he has taken food.

If the attack, when left to itself and pursuing its course in silence and darkness—the favorite environment of the migrainous—accomplishes thus its regular evolution, it may be suddenly interrupted by adventitious modifying circumstances. Many a sufferer from migraine has experienced sudden deliverance from his attack under the influence of a strong emotion, a fright, or a piece of unexpected good news.

[It may be added that the same effect may be produced by full doses of some of the modern analgesics, and especially antipyrine, phenacetin, and caffeine.]

III. CERVICO-OCCIPITAL NEURALGIA.

This is an uncommon form of neuralgia, affecting the sensory nerves of the occipital region, neck and nape of the neck; the pain is located in the first four cervical nerves.

The causes do not differ from those which produce facial neuralgia. According to the observations of Valleix, this form of neuralgia is most generally due to prolonged exposure to cold, as sitting in a draught. Neuritis and congestion of the neurilemma are suggested as probable causes. Diseases of the vertebræ also appear to induce this form of neuralgia, by pressing on the veins as they pass out of the vertebral canal, and swollen lymphatic glands deep in the

neck by pressing on the cervical plexus and occipitalis major (Niemeyer).

There are painful points over the first two vertebræ, at the point of exit of the great occipital nerve from the complexus, over the mastoid process, near the parietal protuberance, and in the auricle.

As the tendency of this neuralgia is to spread to the lower part of the face, it sometimes becomes, as Valleix observes, indistinguishable from neuralgias of the third division of the trigeminus.

In the treatment of this affection, neurotomy has been tried, but with only partial success. Anstie has derived marked benefit from blistering.

IV. CERVICO-BRACHIAL NEURALGIA.

By cervico-brachial neuralgia is meant neuralgia having its seat in the four lower cervical vertebræ and in the first dorsal (the brachial plexus). These are neuralgias of the shoulder, arm, forearm, and hand, and they are often very severe and obstinate.

The causes are oftener extrinsic (from material lesion) than in any other form of neuralgia. Injuries of the brachial plexus by cutting instruments, gunshot wounds, contusions, neuromata, swollen lymphatic glands, or aneurismal tumors in the axilla, periostitis, tubercle or cancer of the vertebræ causing pressure on the nerves at their foramen of emergence, have been enumerated as perceptible causes. Attacks of this neuralgia have been referred to immoderate

exercise of the muscles of the forearm and hand, as in playing on the piano, in sewing, and in knitting.

The pain is paroxysmal, of regular or irregular type, and is characterized by lancinations in various directions, which make themselves felt especially in the terminal expansion of the nerves. The most common seat of cervico-brachial neuralgia, according to Anstie, is the ulnar nerve, though the pain, when intense, always spreads to the other sensory nerves of the brachial plexus. In a very obstinate case to which I have before referred, the principal focus of the pain was the shoulder.

In another case, of which I have notes, the neuralgia was brought on by a contusion (a fall from a carriage). For thirteen years, this patient (an elderly lady) was a sufferer from neuralgia, affecting chiefly the ulnar nerve, the inner part of the forearm and little and ring fingers being chiefly affected. During the severe paroxysms of pain (which were frequent) the fingers were contractured in a semi-flexed condition. The forearm and hand were permanently swollen and somewhat livid, the outer fingers were often numb and cold. Prickly sensations were common. During the painful crises, all the sensory nerves of the fingers seemed affected; the pain being principally in the terminal extremities of the nerves. During the intervals of the attacks, there was always an aching pain along the ulnar side of the forearm. In damp, chilly weather, the attacks were generally worse.

This case seemed to me to be a fairly typical one. Antipyrine in 10 grain doses, arsenic, iron, cod-liver oil, and opiates were all tried in this case. Antipyrine gave much relief the last two years of this patient's life, and frequently stayed the paroxysms, but morphine was often necessary. A proprietary preparation of opium called *svapnia* in ¼ grain doses was resorted to with benefit at times, and seemed to have less baneful after-effects than morphine.

In cervico-brachial neuralgia, neurectomy of the affected nerve has sometimes been followed by a permanent cure.

V. INTERCOSTAL NEURALGIA.

Intercostal neuralgia is neuralgia affecting the sensory branches of the dorsal nerves. These nerves —twelve in number—divide after their emergence from the intervertebral foramen, into an anterior and a posterior branch; the anterior cords are the intercostal nerves, the posterior branches are distributed to the muscles and skin of the back.

The intercostal nerves run along in the intercostal space, at first resting on the external intercostal muscles, then lying between the muscles; beyond the middle of the rib they enter the substance of the internal intercostal muscle, and reach the inner surface, being in contact with the pleura; at the anterior extremity of the intercostal space they pierce the muscles and are distributed to the integument. Midway

between the vertebral column and sternum, each intercostal nerve gives off a lateral cutaneous branch, which pierces the external intercostal muscle and divides into twigs for the supply of the skin of the side of the thorax. The six lower intercostal nerves constitute the anterior cutaneous nerves of the abdomen.

The *points douloureux* are three in number: one posterior, by the side of the spinous processes, over the point of emergence of the nerves; one median, over the point where the lateral cutaneous branch perforates the muscles; an anterior, situated a little outside the sternum, or at the epigastrium, externally to the median line at the origin of the anterior perforating branch. These circumscribed spots are generally very sensitive to touch or pressure.

Intercostal neuralgia is generally unilateral and seated on the left side. It is more common in females than in males, and generally affects several of the intercostal nerves at the same time.

The causes are multiple: impression of cold; contusion of the thorax; neuritis; neuroma; lesion of neighboring organs, as the lungs, pleura, and vertebral column; congestion and dilatation of the intravertebral venous plexuses or intercostal veins. Intercostal neuralgia is a very frequent, though not constant, accompaniment of herpes zoster, and has been known in a very obstinate form to follow attacks of pleurisy. It may be reflex, and accompany catarrh of the digestive tube and diseases of the uterus or

ovaries. It is observed in hysteria, chlorosis, anæmia, malaria, lead poisoning, syphilis, and rheumatism. Michel Peter defines the pain of pneumonia as a pleuritic pain, and regards the latter as an intercostal neuralgia.*

Dujardin-Beaumetz regards the pains in the side observed in phthisical patients at the apex of the lungs as neuritis from inflammation of the lungs and pleura. In tuberculous neuritis it is the first, second, and sometimes third intercostal spaces that are the seat of the pain. In anæmic neuralgias it is the fourth, fifth, and sometimes sixth intercostal spaces on the left side, and the pain is most severe on a level with the fourth dorsal vertebra.

Continuous pain is the predominant symptomatic element, presenting itself under the form of a constrictive tension half girdling the thorax and exaggerated by movements, especially those of respiration (Jaccoud). Along with this dull continuous pain, there are shootings along the course of the intercostal nerves. Real paroxysmal accessions are less common than in other forms of neuralgia, yet they now and then occur.

Double intercostal neuralgia (which is very rare) would, according to Jaccoud, lead one to suspect the existence of an intra-thoracic tumor, or a chronic disease of the spinal cord or its membranes.

---

* Clinical Therapeutics, p. 74.

Intercostal neuralgia is liable to be confounded with pleurodynia or rheumatism of the thoracic muscles. In the latter affection the pain is more diffused than in intercostal neuralgia, is seated in certain muscles, is aggravated by certain movements, and gets well in a few days; moreover, there is absence of the painful points.

With regard to the treatment, the general principles laid down in a subsequent chapter are here applicable. All authorities speak favorably of counter irritation to the skin; Valleix and Erb especially commend flying blisters, applied in succession over the painful points. Erlenmeyer recommends repeated cauterization of the skin with nitrate of silver. Faradization with the metallic brush has seemed sometimes to do good. In one bad case that came under my observation, firm pressure over the painful foci with the bare hand gave great relief during the attacks. Chloroform and menthol liniments and the local application of cocaine solutions confer but little benefit. Hypodermic injections of chloroform or antipyrine may be tried; these failing, the resort, as usual, must be to morphine, by mouth or subcutaneously.

VI. MASTODYNIA—IRRITABLE BREAST.

Women about the period of puberty or from then to the thirtieth year, often, without any perceptible cause, become sensitive to the slightest touch at one

or more points over the mammary gland. Severe pain like tic douloureux, occasionally shoots out toward the shoulder, axilla, or hip.

The disease sometimes develops in connection with pregnancy or lactation. Now and then small neuromata or painful tumors of the nerves of the mammary glands appear to be the starting points of the neuralgia; these consist of connective tissue, not of glandular substance.

Mastodynia is sometimes very obstinate. Cooper recommends a belladonna plaster; Romberg, pills of ext. conii, ext. papaver (ää gr. ij), ext. stramonii (¼ to ½ gr.), to be taken according to indications.

VII. LUMBO-ABDOMINAL NEURALGIA.

Neuralgia of the lumbar plexus is generally situated on the left side. Its causes are various: impression of cold, contusion, alteration or compression of nerves by bony tumors or other tumors in the vicinity. It may be provoked by a mordid state of the genital organs, testicle, uterus, and its annexes, and co-exist with neuralgia of the neck of the womb. It may occupy all the branches of the plexus, or several of them, or each of the following branches: 1. The abdominal branches which furnish the ilio-scrotal nerve; 2. The internal inguinal branches; 3. The external branch which furnishes the scrotal or labial nerves.

The pain, as in all other neuralgias, is permanent, dull, or contusive, or is paroxysmal. The attacks are

spontaneous, or provoked by walking, sudden movements, pressure over the nerve, etc., and remain limited to the bones, the flank, and the inferior part of the hypogastrium, or are propagated to the groin or the testicle, or labia majora, according as the scrotal, testicular, labial branch, etc, is affected. Irritable testicle, according to Sir Astley Cooper, is ileo-scrotal neuralgia.*

The treatment does not differ essentially from that of dorso-intercostal neuralgia.

COCCYDYNIA.—This is neuralgic pain having its seat in the region of the coccyx. Women are more subject to it than men. It is felt particularly in sitting and during defecation. Buzzard regards it as neuralgia of the coccygeal plexus. The treatment consists either in subcutaneous division of the muscles and fibrous structures attached to the coccyx, or in extirpation of the coccyx.†

VIII. NEURALGIA OF THE SCIATIC NERVE.

Neuralgia may attack any of the sensory branches of the sacral plexus, and the term sciatica is often used to designate neuralgia of that plexus. Want of space obliges me to restrict the signification of the word (in accordance with its common acceptation) to neuralgia of the great sciatic nerve.

---

* Reprinted from Clinical Therapeutics, note 3, p. 73.

† *Art. Neuralgia in Quain's Dictionary of Medicine.*

Cotugno, an Italian physician, more than a century and a quarter ago, gave the first magisterial description of sciatica; his pathology has been outgrown, for he attributed the disease, in great part, to dropsy of the nerve sheath, and compression of the nerve substance.

Valleix at a later day, relegated sciatica to the rank of functional neuroses under the name of *femoro-popliteal neuralgia.*

The search for *points douloureux*, as usual, preoccupies Valleix. His painful points are as follows: 1. A lumbar point immediately above the sacrum; 2. A sacro-iliac point on a level with the sacro-iliac articulation, in front of the posterior superior spine of the ilium; 3. Iliac, over the crest of the ilium; 4. Gluteal, at the top of the great sciatic notch; 5. Trochanteric, upper border of the great trochanter; 6. Femoral points superior, middle, and inferior, over the origin of the principal nerves given off from the sciatic; 7. Popliteal, over the popliteal space; 8. Patellar, over the patella; 9. Peroneo-tibial, over the upper articulation of the tibia and fibula; 10. Peroneal, about the neck of the fibula; 11. Malleolar, at the posterior and inferior part of the external malleolus; 12. Dorsum of the foot and plantar region.

In other words, according to Valleix, sciatica obeys the law according to which the pains are concentrated: 1, at the point of emergence of the nerve trunk; 2, in the points where a nerve filament traverses

the muscle to approach the skin to which it is distributed; 3, in the points where the terminal branches lose themselves in the teguments.* Lasègue has pointed out that Valleix, in calling attention to pain and especially paroxysmal pain, as the principal distinguishing element, and overlooking the fact of a morbid organic process with its periods, its acuteness, and its chronicity, has given a picture which is little in accordance with clinical facts as they ordinarily present themselves to the practitioner. He regards sciatica as an organic disease, due to neuritis, or some degenerative alteration of the nerve.

It cannot however, be said that the relatively few post-mortem examinations that have been made of sciatic patients have revealed that constancy of morbid changes which would bear out Lasègue's view. Erb regards the anatomical changes as simply accidental accompaniments of the disease. It is, however, true that in the experience of many practitioners, as in that of Lasègue,† the disease has not been so much characterized by lancinating, ingravescent pangs, as by a constant dull pain aggravated by pressure and motion seated in some part of the nerve trunk.

Causes.—Anstie regards senility as a predisposing cause, and Gueneau de Mussy‡ looks upon sciatica as

---

*See some very judicious remarks on this subject in Lasègue, *Etudes Medicales*, p. 310.

† Lasègue, *Etudes Medicales*, Vol. II. Art. Sciatica.

‡ Gueneau de Mussy *Clinique Medicale*, t. i., p. 306.

a manifestation of a rheumatic or arthritic diathesis. The great length and superficial position of the sciatic nerve renders it peculiarly liable to inflammation from cold and to injuries.*

Among the accidental causes are exposure to cold, and especially damp cold, wounds, contusions, neuritis, fractures, the presence of abdominal, pelvic, stercoral tumors, pressure of the fœtal head during accouchment, etc. Erb regards mechanical pressure by sitting on hard, uncomfortable seats as a frequent cause.

Excessive walking and occupations requiring prolonged standing certainly sometimes seem to favor if not directly cause sciatica, and I have seen one obstinate case accompany diabetes as a part of the decadence and mal-nutrition resulting from that disease.

The disease is oftener seen in robust and hard-working men than in delicate nervous persons, is more frequent in middle life than at any other epoch, and in males than in females. According to Erb's observations, the proportion of males to females is as 4 to 1.

Symptoms.—The disease generally announces itself by a feeling of numbness, tingling, cold or heat in the entire limb, or in certain limited parts; then, after a variable time, there is an outbreak of pain which may occupy different branches of the nerves

* Erb in Ziemssen's Cyclopædia.

(genito-crural, cutaneous femoral branches of the lesser sciatic, articular branches of the great sciatic and peroneal, internal saphenous, short saphenous or posterial tibial, or terminal plantar nerves). As in the other neuralgias, the pain may be looked upon as *double;* there is a continuous element, a deep, contusive pain, and a paroxysmal element, manifesting itself by ascending, descending, or irregular lancinations*.

"Under the influence of walking, muscular exertion, heat, or without any known cause, lancinating pangs, are experienced radiating along the course of the nerve; the patient can often mark out with his finger the track of the painful nerve. These pains are exasperated by pressure and by movement. The patient instinctively seeks repose and avoids all muscular contractions, lying on the opposite side from the pain. In some cases the patients feel in the bones and joints a sort of a deep and piercing pain, which, according to Jaccoud, indicates an intra-vertebral origin of the neuralgia. When there are, moreover, alterations of sensibility, consisting in formications, tingling, aching sensations in the back, the neuralgia has for its origin a lesion of the cord or meninges acting on the posterior columns.

Apart from the attack some patients suffer little and are able to work. Others become incapacitated,

---

* Jaccoud, Path. Interne, t. 1, p. 502.

walk with difficulty, limping, or even are compelled to cease walking altogether.

Besides these pains, disorders of the cutaneous sensibility have been noted, and Hubert Valleroux describes sensory troubles (pertaining to tactile sensibility, sensibility to temperature, etc.), especially occupying the posterior region of the thigh, or four or five fingers' breadth below the popliteal space; atrophy of the affected member has been noted; a slow, muscular atrophy in the pure neuralgias, a more early atrophy in the neurites. Some writers have observed changes in the temperature and in the color of the skin, erythema, furunculi, patches of herpes along the tract of the nerve.

Sciatica has a very irregular march. It may cease spontaneously and periodically; its duration is very variable, from several days or weeks to years. Relapses are frequent."*

Treatment.—The general principles of treatment applicable to the other neuralgias are applicable to sciatica.

Of the new methods of treatment, the chloride of methyl spray is perhaps the most noted. A peculiar apparatus is needed to carry out this treatment, which is attended with congelation, smarting and burning, but afterwards with marvellous relief. Dujardin-Beaumetz says that in real sciatica he has generally

---

* Reprinted from "Clinical Therapeutics."

found the pain to cease after one or two applications of chloride of methyl spray. (See the subject treated fully in New Medications, published by G. S. Davis, Detroit, page 285.)

The ether spray, directed over the affected nerve or nerves, gave great relief to one of my patients in his atrocious paroxysms.

Cotugno was the first to propose cantharides blisters, and all subsequent authorities have spoken well of them. The blisters should be of the size of the palm of the hand, and applied at intervals of two or three days over the painful regions. Anstie recommends blistering to the sacrum—the blisters may be dressed with some simple ointment and healed, then put on again.

The actual cautery has been recommended by Valleix, Jobert, and others—light, superficial, "transcurrent" cauterization being employed.

Faradization by the electric brush has had its advocates. Erb has seen brilliant cures from galvanism of the affected nerve—the anode being placed upon the sciatic foramen, or sacrum, and the cathode upon the specially painful parts.

Among specific remedies, oil of turpentine has been extolled; oil of turpentine, ʒ j, honey, ℥ j; a tablespoonful twice daily.

Neurotomy and nerve-stretching have not given very satisfactory results; neurotomy is not to be recommended except when the pain is confined to a small branch.

But almost always the resort must be had, sooner or later, to chloroform injections, antipyrin injections, or to narcotics. The deep injection of chloroform into the substance of the gluteal muscle over the nerve, is Bartholow's method; (see Appendix, page 116). Antipyrin may also be used to advantage hypodermically (see also Appendix, article "Antipyrin"). Opium may be used in the form of enema; 30 drops of laudanum to 2 ounces of thin starch, the injection to be retained. Generally the narcotic will be more speedy and effectual if employed in the form of morphine injections subcutaneously administered (for directions, see Appendix, article "Opium"). Hammond gives instances where the hypodermic of morphine was given every day for three or four months. This treatment would be quite certain to make a morphiomaniac of the patient.

Doubtless, in the congestive attacks produced by cold, revulsion by irritant liniments (menthol, turpentine, etc.) and vesicants do the most good, while in the purely rheumatic form benefit may be expected from a prolonged course of iodide of potassium.

CHAPTER V.

VISCERAL NEURALGIAS.

The internal organs are mainly supplied with nerves from the great sympathetic. Although the ganglionic nerves are sensory as well as motor, yet the sensibility of the sympathetic system differs in many respects from that of the cerebro-spinal system. In the normal functionment of organs innervated by the sympathetic, there is little sensibility and never pain. We are not, for instance, in health cognizant of the state of our digestive tube during digestion; the changes which the food is undergoing do not enter as an element into our consciousness, unless, it may be, in contributing to a massive, vague, indefinable sensation of *bien-être*, called by Maudsley, *cœnæsthesis*.* In pathological states, however, the sensory elements of the sympathetic declare their existence by vague impressions of discomfort, if not by actual pain. Pain of a severe kind is experienced in gastric cancer as well as in gastralgia, in enteritis, etc., and the uterus, which in the normal state is insensitive, in various morbid conditions may be the seat of severe pain.

---

* "The general feeling of well being which results from a healthy condition of all the organs of the body * * * is known as the *cœnæsthesis*." Maudsley, Physiology and Pathology of the Mind, page 135.

In neuralgia of the viscera, the pain is deep seated, sometimes a dull, heavy ache, sometimes of a boring character, rarely lancinating. "It does not dart, like the pain of superficial neuralgia, but is either constant or comes in waves which steadily swell to a maximum and then die away, often leaving the patient in a state of profound temporary prostration" (Putnam).*

The pain is generally diffused, and there are no definite points douloureux although the organ may be tender to touch. In severe attacks there are painful irradiations, as in the superficial neuralgias. Pressure generally relieves the pain, it never provokes an attack.

General disorders like those that attend the neuralgias of the cerebro-spinal system accompany the visceral neuralgias, in virtue of the law that one part cannot suffer without entailing suffering on the whole. Besides the loss of appetite and the decadence in the nutritive functions with consequent emaciation, there are reflex disturbances which are often of a serious nature; witness the nausea, vomiting, indigestion, constipation, which attend uterine or ovarian neuralgia. The functions of the organ which is the seat of the neuralgia are also more or less disturbed or interrupted; thus, in gastralgia, digestion is suspended, and food, if taken, provokes vomiting.

---

* Pepper's Syst. American Medicine, Vol. v, page 1215.

It is needless to say that the causes of visceralgia are the same as those which produce neuralgias of the cerebro-spinal system, and that neuralgias of the sympathetic are often interchangeable with the superficial neuralgias which occur in states of anæmia and prostration, in persons of a neuralgic habit, etc.

Uterine and Ovarian Neuralgia.—It is now generally conceded that the uterus is sometimes the seat of a suffering which is essentially neuralgic. There is, for instance, a form of dysmenorrhœa called, by common consent, neuralgic. The pain is independent of all organic disease; it is not due to any obstruction to menstruation, but attends the monthly function on account of an exaggerated irritability of the ovaries. The pain manifests itself before or after the beginning of menstruation, and may cease when the flow becomes established, or may continue through the period.*

In some patients the whole period is one of intense suffering; commencing with sharp, darting, lancinating pain in the uterus and vagina, and extending down the thighs. There is often severe reflex pain in one or both breasts.

Hysteralgia is sometimes coincident with neuralgic affections of the cerebro-spinal nerves, sometimes it takes the place of the latter; it is apt to occur in persons of the neuralgic disposition.

---

*Jenks, Diseases of Menstruation, Detroit, 1887.

Anstie speaks of a class of cases, which, I believe, are sufficiently common in the experience of physicians, where the affection "appears to be a severe ovarian neuralgia, attended with a vaso-motor paralysis which causes great engorgement of the ovary and consequent difficulty of ovulation."* He also believes that peri-uterine neuralgia is often due to peripheral irritation, arising from such sources as the following: Ascarides in the rectum; profuse and irritable leucorrhœa; calculus in the kidney and ureter; prolapsus uteri; tumors in the uterus or its appendages; ulcer of the cervix; large masses of scybalous fæces in the rectum, etc.

Treatment.—In the endeavor to alleviate uterine neuralgia, the general principles of treatment to be hereafter set forth are applicable. A fortifying regimen is to be insisted upon, of which exercise in the open air is an essential part. All delicate females are the better for judicious gymnastic training. Hydrotherapy properly administered is a powerful adjuvant to the treatment. Some cases of neuralgic dysmenorrhœa are cured by marriage.

The diathesis should be kept in view; anæmic and chlorotic patients require iron, arsenic, strychnia, and all the elements of the hæmatic and tonic regimen. Rheumatic cases demand salol, iodide of potassium, and especially guaiacum. Dewey's ammo-

---

*Anstie, on Neuralgia, Etc.; Am. ed ; p. 72.

niated tincture has had considerable repute in rheumatic dysmenorrhœa.

Jenks* speaks favorably of electricity; a mild galvanic current down the spinal column for ten minutes, and a strong current through the pelvis; the whole sitting not to exceed twenty-five minutes.

Among the external remedial agencies, revulsive applications to the os and cervix with the Paquelin cautery, or the acid nitrate of mercury have the endorsement of Dujardin-Beaumetz.†

Narcotics will often be required where simpler remedies fail to relieve the pain, and here suppositories of opium, morphine, belladonna, will render good service. Jenks gives several formulæ in his useful little book on the Disorders of Menstruation, which belongs to the series of 1887. The morphine suppository of the U. S. Ph. has proved useful in my practice. Lavements of thin starch and laudanum have also promptly relieved the pain.

Of late, antipyrin, by mouth, hypodermic injection, or lavement, has been attended with excellent results. Germain Sée especially recommends the administration by lavement. The following formula may be employed: Antipyrin, ʒ i; starch, ℥ ij. M. For one injection, which should be retained.

Jenks speaks well of cimicifuga racemosa, begun

---

* *Loc. cit.*, p. 60.

† Clinical Therapeutics, Detroit ed., page 73.

two or three days before the flow, and continued at brief intervals through the entire period. The dose would be half a fluid drachm to a drachm every four or six hours. The tincture of pulsatilla in three-drop doses every two hours while the pain lasts has been highly recommended.

The fluid extract of *black haw* (viburnum prunifolium) in teaspoonful doses every four hours has achieved good results in neuralgic dysmenorrhœa. The *liquor sedans* of P., D. & Co. has viburnum prunifolium along with Jamaica dogwood and hydrastis Canadensis.

Neuralgias of the bladder, urethra, testicle, and spermatic cord, have been observed. A neuralgia of the liver, under the name of hepatalgia, has also been described. A more common form is neuralgia of the stomach, known as:—

Gastralgia, or *gastrodynia*.—This is a very painful affection, met with in persons of a delicate, neuropathic temperament. It is often associated with anæmia, sometimes with hysteria. In other cases, arthritis is the underlying element. One very severe case which came under my observation attended overwork and lactation in a patient who had been a sufferer from neuralgia.

It is probable that gastralgia is a neuralgia of the pneumogastric nerve, as the stomach is supplied with sensory as well as motor fibres from that nerve.

The special characteristics of true neuralgic pain

in the abdominal pneumogastric nerve, are: (1) It comes on in states of exhaustion; (2) unlike dyspeptic pains, it is relieved by food; (3) it is also relieved by stimulants, as brandy and water, thus resembling colic; (4) it is diminished by pressure, which aggravates most pains dependent on local organic mischief (Anstie). "The most severe example of gastralgia which I have ever seen," says Anstie, "was entirely unaccompanied by dyspepsia; this patient absolutely attempted suicide to escape from his agonizing pains, which recurred with the greatest frequency and obstinacy, but were at last entirely removed by strychnia."

Although gastralgia is not dependent on dyspepsia, it is sometimes provoked by food, even of a bland and digestible character, just as neuralgic attacks of the peripheral nerves are frequently provoked by ordinary stimuli. One marked instance of this kind has come under my observation, which was in this sense an exception to the rule as laid down by Anstie.*

Treatment.—Causal indications, as far as possible, must be attended to; anæmia and chlorosis demand the appropriate remedial agents. Leube†

* Mrs. A., living in Beck street, Newburyport, for weeks a sufferer from typical gastralgic attacks, which at certain times were brought on by anything whatever introduced into the stomach, and were not relieved by free vomiting.

† Ziemssen's Cyclop., vol. vii., p. 306.

speaks favorably of the lactate of iron in 3-grain doses with equal parts of aromatic powder or extract of cinchona.

In gastralgia due to hysteria, arthritis, etc., the underlying diathesis must be treated. Gouty or lithæmic patients require alkalies (Vichy water, lithia, potas. carbonate), colchicum, saline laxatives, the proper dietary regimen, and possibly a derivative treatment. Garrod recommends that the attempt be made by warmth and counter-irritants to excite derivation to the joints.

If the stomach be in such a hyperæsthetic condition that food excites the pain, it is still better that food be taken; there is nothing gained by a starvation treatment.

As special remedies, Anstie speaks highly of nux vomica; ten drops of the tincture to be taken three times a day. The hyperæsthetic stomach is sometimes benefited by full doses of bismuth, or oxalate of cerium. Hypodermics of morphine may be demanded. Leube especially recommends galvanism: ten to fifty elements, the anode upou the painful point of the epigastrium, the cathode on the left axillary line; the application to be kept up from five to ten minutes.*

---

* Leube, *loc. cit.*

ANGINA PECTORIS AND THE TRUE CARDIAC NEURALGIAS.

There is a form of cardiac pain which is always of bad prognosis, because indicative of organic and generally incurable lesion. It was first correctly described by Rougnon, and nearly simultaneously by Heberden, in 1768; it was afterwards called Heberden's disease, though Heberden gave it the name of *angina pectoris*, the word *angina* being indicative of the peculiar anguish accompanying the attack. Seneca, who appears to have been a sufferer from angina pectoris, speaks in one of his letters of the suddenness of its invasion, which he compares to the impetuousness of a tempest (*brevis impetus, procellæ similis*); and he adds that the predominant sensation is one of anguish as of impending death.

This kind of cardiodynia has its seat in the terminal cardiac filaments of the pneumogastric nerve, and is due to ischæmia of the heart muscle. The old theory was that angina pectoris is a primary or symptomatic neurosis of the cardiac plexus. This is denied by the best recent authorities, who compare the pain to that attending gangrene from occlusion of an artery.

"Let us suppose," says Germain Sée,* "that the myocardium receives less than its normal quantity of

* G. Sée: Maladies du Cœur, 2d ed., 1883, p. 30.

blood; the terminal extremities of the vagus will receive less also. Now oligæmia of a sensory nerve manifests itself by pain. This oligæmia also accounts for the peculiar distress, the *angor*."

Huchard, in a recent work on arterio-sclerosis and the arterial cardiopathies†, which is the most complete by far that has yet appeared, sums up the numerous anatomatical and other theories, and gives weighty reasons for the view, which he holds in common with Balfour, Kreysig, Tiedemann, Potain, Parry, Liegois, Sée, and others, that true angina pectoris is always dependent on lesions (sclerosis, thrombosis, atheroma, sometimes, however, spasm) of the coronary arteries, with ischæmia of the myocardium. The ordinary lesion is arterio-sclerosis, which is sometimes of toxic origin (diathetic, alcoholic, nicotinic), sometimes a senile degeneration.

There is an angina pectoris which ends almost always in sudden death; there are other kinds of cardiodynia, quite as distressing, which almost invariably terminate in recovery. The latter are functional and nervous. Huchard ranges the latter under the head of false angina pectoris (pseudo angina); they constitute the true neuralgiæ of the heart.

Huchard divides the peculiarly neuralgic forms into three classes: the neurotic, the reflex and the

---

† **Huchard: Maladies du Cœur et des Vaisseaux, etc., Paris, 1889.**

toxic. He formerly added a fourth the diathetic; but, he is now conviced that this, as a separate class, has no *raison d'être.*

(1.) The neurotic is that painful condition of the cardiac innervation which has its origin in the state of the nervous system accompanying hysteria, neurasthenia, hypochondria, exophthalmic goitre, spinal irritation, neuro-arthritism, and (according to some authors) epilepsy.

(2) The reflex form, of peripheral or visceral origin, takes its point of departure in some distant irritation, as of the stomach, uterus, etc., which is reflected on the cardiac plexus. Huchard, under this head, gives instances of reflex pseudo-angina accompanying intercostal neuralgia, painful peripheral excitation of the nerves of the extremities, neuromata, and neuralgia of the left arm.

(3) The toxic form, is perhaps, oftener caused by tobacco than by any other agent, and this (the nicotinic) is given as the typical, toxic species, though cases have been referred to tea, coffee and alcohol. There is a functional cardiodynia from tobacco-smoking relatively benign, resulting from spasm of the coronary arteries; this Huchard calls *spasmo-nicotinic angina.* There is another kind, also due to abuse of tobacco, which is dependent on arterio-sclerosis; he calls it *sclero-nicotinic angina.*

The following table from Huchard, gives the principle distinctive features of the true and spurious anginæ:

TRUE, ARTERIAL ANGINA PECTORIS.

Anatomical Cause.—Aortitis, with obliteration of the coronary arteries. Sclerosis, with constriction or obliteration of the coronaries. An arterial affection.

Symptoms.—Pains almost always paroxysmal, not permanent, provoked by walking, emotional excitement, effort. Rarely periodical and nocturnal attacks. Cardiac pain isolated from other neurotic symptoms. Agonizing pain, with sensation of compression as a vise. Pains of short duration, ceasing with repose. Sub-sternal seat of the pain, generally over the aorta.

Attitude of the Patient.—Silence, arrest of all movements, the pain ceasing with absolute rest. No painful points, but the latter may be present when true angina is complicated with cardiac and phrenic neuritis by propagation of the peri-arteritis to the plexuses of nerves in the vicinity. Often sub-sternal anguish without pain.

Prognosis.—True angina pectoris is almost always fatal.

Treatment.—Arterial medication. Revulsives of no account.

FALSE, NEURALGIC ANGINA.

Anatomical Causes.—Aortitis with neuritis of the cardiac plexus. Hyperæmia of the cardiac plexus. Neuralgia of the cardiac plexus. A neuralgic or neuritic affection. Often (as in hysteria) a vaso-motor neurosis.

Symptoms.—Pains less frankly paroxysmal, often periodical, coming on at the same hour (hysterical, neurasthenic, pseudo-angina); not provoked by effort, but often caused by cold. Attacks frequently periodical, recurring at fixed hours, and nocturnal. Cardiac pain associated with other neurotic symptoms. Pain less agonizing, with sensation of distention of the heart. Pains of long duration, not ceasing by repose. Seat of the pain often frankly cardiac.

Attitude of the Patient.—Incessant agitation. Continuance of walking; rest brings no diminution of the pain. Existence of points painful to pressure, especially along the tract of the phrenic nerves (neuritis of the cardiac plexus and of the diaphragmatic nerve). Anguish less pronounced, always associated with the pain. Pseudo angina is never fatal, except in cases where the cardiac neuritis is associated with coronary sclerosis.

Treatment.—Anti-neuralgic remedies. Revulsives often beneficial.

REFLEX, NEURALGIC, PSEUDO-ANGINA PECTORIS.

A nervous affection.

Symptoms.—Attacks spontaneous at times, but often provoked by movements of the left arm, and by pressure over the painful nerves. Depends on some other (peripheral) neuralgia (brachial, dorso-intercostal), on gastric or other visceral disorder. Is observed at all ages. Attacks long, not provoked by effort. Attention is early called to the visceral or other affection. Pain precordial, with feeling of distention; little irradiation to arm and neck. In gastric pseudo-angina, signs of dilatation of the stomach often accompany it. Prognosis benign, never terminates in death.

Treatment.—Revulsives, calmatives, anti-neuralgic remedies, anti-dyspeptic remedies.

TOXIC PSEUDO ANGINA (FROM TOBACCO).

(Generally by spasm of the coronaries.)

Symptoms.—Attacks of angor, generally associated with other phenomena of a toxic kind; vertigo, gastric and respiratory troubles, etc. Cardiac pain accompanied by other functional heart symptoms, such as palpitations, intermittences, arythmia, lipothymia, etc. Attacks long. Paroxysms generally spontaneous, rarely provoked.

Prognosis.—Rapid disappearance of the symptoms by suppression of the toxic cause.

Huchard gives an exemplification of the difficulty under which the clinical observer must sometimes labor in diagnosticating the affection. "In gout he may have thoracic angor under three conditions: (*a*) it is either a true angina, arising from an arterial lesion (arterio-sclerosis, atheroma of the coronary arteries, lesions of the aorta, etc.) to which gouty persons are always predisposed; or (*b*) gastric troubles, frequent in gouty patients, may provoke attacks of false angina pectoris which may terminate in recovery; or (*c*) the angina pectoris may be a neuralgic attack, such as gouty neurasthenic invalids are prone to."

In true angina pectoris, the leading indication is to remedy the cardiac ischæmia which causes the pain. This indication can be only partially met by the so-called vaso-motor dilators,—nitrite of amyl (two or three drops to be inhaled from the open palm); nitro-glycerin (frequent drop doses of the centesimal solution); and iodide of sodium, which, according to Huchard, should be given in ten-grain doses three or four times a day for a long time. Hypodermics of morphia seems to favor the capillary circulation, as well as allay nervous irritation, and will be often demanded in severe paroxysms.

In the pseudo forms, the general anti-neuralgic and revulsive treatment will be called for, due attention being given to the cause, whether peripheral, visceral, or toxic.

CHAPTER VI.

REFLEX AND TOXIC NEURALGIAS.

NEURALGIAS DUE TO A GENERAL MORBID CONDITION.

Reflex neuralgias are caused by a lesion more or less distant from the seat of pain. The irritation is transferred or reflected from one set of nerves to the terminal filaments of another through the medium of the cerebro-spinal or sympathetic system. The sympathetic nerve is ordinarily the seat, and the primary cause of the pain generally resides in some one of the viscera, although the painful reflex may start in a cerebro-spinal nerve branch; an instance of this is seen in the severe eye-ache or brow-ache which sometimes attends a carious tooth that may itself be painless. Lisfranc *once obtained the cure of a sciatica by the extirpation of a painless vaginal polypus. Other examples of reflex neuralgias are found in the hepatalgia accompanying gastritis, gastralgia caused by tænia, cystalgia due to an affection of the kidneys.†

*Vanlair, *Loc. cit.*

† "When no local pain is felt, we must assume that the centre to which the apparent impressions directly come is not thus excitable to painful activity, or even so as to influence consciousness, but that it is in connection with another centre which by natural or acquired susceptibility is disposed to excessive action," "(Gowers' Neuralgia, Its Etiology, Diagnosis, and Treatment," p. 27.) The above is essentially Vanlair's explanation of reflex neuralgias, where the pain seems to spare the sensory centres of the region in which the cause exists, to be reflected on some distant centre.

Eye-strain is a fruitful cause of headache and neuralgia. This has been made very clear by Dr. Ambrose L. Ranney, in an article in a late number of the *New York Medical Record:*

For some years past it has been my custom to examine repeatedly and with care, the visual apparatus of every patient sent to me for the relief of headache and neuralgia. I have already published, from time to time, many cases where this line of research has been followed by marked and permanent benefit.*

I deem it worthy of remark, in this connection, that less importance is being attached to-day than formerly to the clinical determination of modifications in the calibre of the blood-vessels of the brain.

The conditions known as "cerebral congestion," or "cerebral anæmia" of certain authors who have written extensively upon headache and neuralgia, are very often the results of underlying factors.

Their existence (as has been claimed) may sometimes be revealed by the ophthalmoscopic examination of the vessels of the retina and confirmed by the effects of nitrite of amyl upon the patient; but when so, they are probably to be regarded rather as an evidence of a functional derangement of the vaso-motor system of nerves, than as permanent factors in headaches or neuralgias.

I have known many patients who have followed, with negative results, a prolonged course of treatment (by ergot, bromides, amyl, etc.), which was based upon the examination of the retinal vessels, and I have often seen them recover from their headaches and neuralgias without drugs when an anomaly of the refraction or of the muscular adjustment of the eyes was corrected.

I would not be construed as denying that the blood-vessels of the brain might not have been abnormally dilated or peculiarly contracted in many of these cases at the time when their retinal vessels were examined; nor would I utterly reject

---

* *New York Medical Journal*, January, 1888; Lectures on Nervous Diseases, Philadelphia, 1888 (F. A. Davis, Publisher); *Medical Register*, Philadelphia, November 19, 1887.

the hypothesis that the retina sometimes affords us a valuable means of determining by our sense of sight the condition of the cerebral vessels in any given individual.

What I do mean to assert is this: That changes in the cerebral circulation (as is often observed in the case of a blush upon the cheek) may be caused by subtle nervous influences that ergot, bromides, nitrite of amyl, or other drugs will not arrest; that a classification of headaches or neuralgias which is based upon so variable a sign is unscientific; and that any line of medication which is directed toward this condition alone is very liable to be unsatisfactory, both to the physician and his patient, sooner or later.

To illustrate this point I will mention a remarkable experience of my own that impressed me strongly at the time.

Some ten years ago, when almost in despair from continuous and intractable headache, and doubtful of my ability to long endure it, two oculists of equal prominence and ability were asked by me to examine my retinæ by means of the ophthalmoscope.

One diagnosed my condition as "typical nicotine poisoning of the retina;" the other discovered what seemed to him to be conclusive evidences of "congestion of the brain," and that nothing but prolonged rest from work, in his opinion, could relieve. Neither suggested the detection of any "lateral" refractive error, or the use of glasses. My sight was apparently perfect and unusually acute.

Subsequently the instillation of atropine into my eyes (which was used at my earnest solicitation) and the correction by proper convex glasses of a hypermetropia of 3.00 diopters (not previously suspected) restored me to health and comfort as if by magic. A complete and immediate cessation of all pain for over nine months followed the correction of my refractive error; and for many years I have been almost entirely free from pain, in spite of continuous eye-work at my desk and elsewhere."

Dr. Ranney reports fifty cases of headaches—supra-orbital, frontal, and occipital neuralgias, which were relieved or cured by tenotomy of the recti muscles, or by suitable corrective glasses. He urges the necessity of using atropine upon a patient for diag-

nostic purposes when an error of refraction or of accommodation is suspected.

"Personally," he adds, "I do not regard an examination as complete without it. It solves the common question of the presence of 'latent' hyperopia—a very common defect, and possibly a very serious one (from the stand-point of the neurologist) if allowed to go unrecognized. It reveals the existence of a previous ciliary spasm. It often arrests headache as if by a magic touch, and solves the nervous origin of many other similar symptoms."*

These reflex neuralgias are familiar to everybody who has known headache from indigestion or from constipation. The disturbances of the alimentary canal are reflected upon sensory branches of the fifth nerve; here relief can only be obtained by remedies which correct the disorders of the digestive tube. I know persons whose "bilious headaches" (as they are called in the older terminology) are speedily remedied by an emetic of ipecac or a calomel purge; others can only keep free from these headaches by rigid dieting and some mild stomachic and aperient, like the infusion of rhubarb and cardamoms:

℞ Rhubarb, in coarse powder,
Cardamom seeds (bruised), ää ʒ i.
Aquæ ferventis, ℥ viii.

M. Infuse half an hour, strain, and take a wine-glassful when the stomach is oppressed.

Pathology is full of instances of disturbances of function owing to a morbid irritation in a distant part of the body. Thus, the irritation of teething sometimes causes convulsions,

* *New York Medical Record*, Jan. 22, 1889.

and a prolapsed uterus has been known to cause melancholia. Maudsley thus explains this reflex transmission: "A molecular change in the interior of a nerve being set up by the primary irritation * * * is carried to any part with which it is in connection by continuity of nerve structure; when the molecular agitation reaches a motor centre it is reflex movement or reflex paralysis; when it reaches a sensory centre it is reflex or sympathetic sensation; when it reaches the supreme ideational centres it may occasion reflex disorder of thought, feeling, and will."

Toxic Neuralgias.—A good instance of neuralgia of toxic origin is the hemicrania which sometimes attends renal insufficiency and uræmic poisoning. This kind of neuralgia has, however, been classed by some authorities among the holopathic, which are due to a general morbid state. (See Vanlair's table). Lead colic is an obstinate neuralgia of the abdominal walls from lead poisoning. The pain ordinarily starts from the umbilicus and radiates through the entire abdominal muscles. It presents at times atrocious paroxysms; is ordinarily accompanied by nausea, vomiting, and constipation. The treatment is by calmatives, purgatives, and iodide of potassium; the latter favors the elimination of lead from the system.

The osteocopic pains of syphilis have been classed among the toxic neuralgias. Here the specific treatment alone will do good; small doses of calomel, $\frac{1}{10}$ grain every hour for a day or two, sometimes work marvellous results.

Syphilitic neuralgia is also a *holopathic* neuralgia,

according to Vanlair. But syphilis is attended with palpable lesions which cause pain, and the existence of true neuralgia from syphilis has been disputed.

Some cases of neuralgia from mercurial salivation have been noticed. Anstie narrates one of a young girl, who not only lost every tooth in her head and suffered extensive exfoliation from the maxillæ, but after the process was over suffered frightfully from neuralgic pains in her arms and legs. This patient got better under tonics and cod liver oil, but was never fully restored. In neuralgia from abuse of mercury, it is found that iodide of potassium in as large doses as can be borne, and continued for months, gives the most relief.

Neuralgias from alcohol, tobacco, arsenic, and ergot, have also been noted; these agents operate not so much by their irritant properties as by bringing about a condition of malnutrition and dyscrasia.

Under the head of toxic neuralgias might also be ranged many neuralgias which, like the neuralgias of syphilis and Bright's disease, are due to some morbid material in the blood depressing innervation and disturbing nutrition; they are also neuralgias due to a general morbid state. Thus writers have spoken of:

1. *Gouty Neuralgia.* Gouty neuralgia has a predilection for the viscera, especially for the gastro-intestinal canal (Vanlair), and for the sciatic nerve. These neuralgias sometimes take the place of the regular gouty paroxysm (having thus a metastatic

character); they disappear under the influence of an arthritic attack (gout in the great toe), or even of a cutaneous eruption; they coincide with the uric acid diathesis; the exciting cause is often exposure to cold, even an unusual dampness in the atmosphere. These neuralgias are benefited by calmatives, by derivation to the usual seats of election of the gout, by alkalies, by colchicum, by drastic purgatives, and, in short, by the general treatment of gout.

2. *Rheumatic Neuralgia.* It has been customary to regard those painful attacks which are consequent on "catching cold" (as when a person is exposed to cold and wet, and has severe pains in the muscles of the neck, in the shoulders or back, in the tract of the sciatic nerve), as rheumatic neuralgia. Undoubtedly face-ache and migraine are often excited by sitting in a draught. There is much obscurity with regard to the pathogeny of neuralgia *à frigore*, as well as of rheumatic neuralgia generally; nor is even the particular *materies morbi* of rheumatism yet known. Erb believes that in these rheumatic neuralgias, slight inflammatory conditions of the neurilemma are commonly present (hyperæmia, swelling, exudations, etc.) Eulenburg states that neuralgia caused by cold, more frequently attacks the sciatic nerve than any other, and thinks that the tendency to sciatica is characteristic of the relation of rheumatism to the sensory nerves.*

---

* Cited by Anstie.

To justify one in calling any particular neuralgic attack rheumatic, he would have to show a history of previous rheumatism; it would not be enough to infer a rheumatic origin from the fact that the attack followed exposure to cold and wet. It is doubtful whether rheumatism or the rheumatic diathesis has any very frequent causal connection with any form of neuralgia.

3. *Diabetic Neuralgia.*—Neuralgia has sometimes occurred in instances where it was convenient to trace the painful affection to a "glycæmic crasis" of the blood, and where an anti-diabetic regimen has alleviated or cured the pain. Worms* has made a special study of this neuralgia; these are his conclusions:

(1). There exists a special form of neuralgia proper to diabetes, which presents for its character a disposition to be seated in the two symmetrical branches of a same nerve;

(2) Thus far, this symmetrical neuralgia has been chiefly observed in sciatica, and in the inferior dental nerve;

(3) Diabetic neuralgia appears to be much more painful than the other neuralgias;

(4) It does not yield to the ordinary treatment of neuralgias (quinine, morphine, bromides, etc.);

(5) It is aggravated or mitigated coincidently with the aggravation or attenuation of the glycæmia.

---

* Vanlair, loc. cit., p. 309.

4. *Albuminuric Neuralgia.*—There is probably no disease that more profoundly modifies and vitiates the blood than Bright's disease in its advanced stages. Irritation and degeneration of the nervous centres is certain to follow; hence the stupor, the convulsions, the obstinate headaches, the amaurosis of chronic parenchymatous or interstitial nephritis. The headaches of albuminuria are uræmic (whatever that word may mean); they are generally seated about the brow or vertex, are obstinate, lasting in some cases five or six weeks without much mitigation; are exasperated by heat and light, and resist all ordinary therapeutic means, though they sometimes yield to a thorough depurative treatment.

5. *Zymotic Neuralgias.*—Obstinate neuralgia sometimes follows the acute infectious diseases, and as a result of the general blood poisoning and nerve degeneration. Patients convalescing from diphtheria, typhus, yellow fever, cholera, the eruptive fevers, etc., besides being predisposed to the ordinary neuralgias, are often afflicted with severe pains of a very peculiar and puzzling nature. Such was the case of a young man, a private patient whom I last year attended during an attack of typhoid fever. The disease ran a severe course, and convalescence only came on about the thirtieth day of the fever, and was slow and tedious. This patient complained of pains, sometimes acute and shooting, sometimes dull and continued, in the soles of his feet. These pains were such

as to deprive him of his sleep, and morphine injections were for a long time required; they eventually wore off with return of health.

Another patient whom I attended in the Anna Jaques Hospital for typhoid fever, had, during convalescence, severe pains in the calves of the legs.

It should be mentioned in this connection, that some authorities, as Vanlair, do not regard these neuralgias as so much due to the presence of bacteria in the blood or poisonous ptomaines, as to the degenerative lesions of the nervous system brought on by long exhausting illness.

6. Under the head of *holopathic* neuralgias, Vanlair classes certain *mestastatic neuralgias* due to the abrupt suppression of the menses, of a hæmorrhoidal flux, of chronic pulmonary catarrh, or of old ulcers. He might have added, the retrocession of a cutaneous eruption. I myself once witnessed the supervention of a severe hemicrania in a woman on whom I had operated by ligature for bleeding piles; it was only after some months of rather frugal dieting, and the plentiful use of Carlsbad salts, that this patient obtained exception from headaches. Barras cites a similar case, where obstinate gastralgia followed the suppression of hamorrhoids.

7. *Hysterical Neuralgias* belong to the same category of neuralgias due to a general morbid state. Hysteria is responsible for a great variety of neuralgic affections, ramicular, visceral, and cutaneous.

Hysterical neuralgia is prone to take on the hemicranial form, and the characteristic *clou hysterique* has long attracted the attention of physicians. Hysterical neuralgias have a marked prediliction for the left side of the body.

These neuralgias markedly resemble the idiopathic, but their dependence on a diathesis justifies their classification among the holopathic.

8. *Chlorotic and Anæmic Neuralgias.*—Neuralgia, according to Trousseau and Pidoux, "is an almost constant symptom of chlorosis"

The three forms most peculiar to this morbid constitutional state are headache, gastralgia, and muscular aching; the latter resembles the sensation of fatigue rather than muscular rheumatism.

It is in these cases that a tonic, fortifying regimen (exercise in the open air, boating, horse-back riding, skating; full diet consisting of meat, eggs and fats), with iron, arsenic, and manganese, sometimes works wonders. Attention to the excretions is important; iron does not work well if the bowels are constipated; warm baths to promote the cutaneous functions followed, as the patient can bear it, by cold water treatment, may be important adjuvants to a successful medication.

9. *Malaria* is frequently a cause of neuralgia, especially in regions where fever and ague prevail. The nerves most commonly affected are the supra-orbital branches of the fifth. A distinct feature of this in-

termittent brow-ache is a periodicity of the attacks which are separated by intervals of complete calm. The type is tertian, double tertian or quartan, although the quotidian type is by no means uncommon. It is in this kind of neuralgia that quinine in full doses is attended by the happiest results.

10. *Ergotic* neuralgia (from eating spurred rye) has been witnessed in certain parts of France. The extremities (hands or feet) are affected with numbness, tingling, darting pains (acrodynia or cheiropodalgia). It is doublful if this affection can properly be called a true neuralgia.

CHAPTER VII.

DIAGNOSIS.

The distinguishing features of idiopathic neuralgic pains are: 1. Their frankly intermittent or remittent character; 2. The suddenness of their onset (Anstie gives as an example the sudden and violent neuralgic pain of the eyebrow which some persons experience from swallowing a bit of ice); 3. The limitation of the pain to a definite nerve trunk or the area occupied by its terminal branches, and its generally unilateral character; 4. The *points douloureux* which occur in various parts of the tract of the nerves; 5. The various motor, vaso-motor and trophic disturbances which accompany the painful phenomena, and which pertain principally to the area of distribution or immediate vicinity of the nerve or nerves affected; 6. The absence of fever or other marked constitutional disturbance and the signs of local inflammation; 7. Finally, the characteristic common to all neuralgias, that fatigue and every other depressing influence directly predispose to an attack and aggravate it when already existing (Anstie).

With these diagnostic characteristics in mind, one will hardly confound an ordinary headache from indigestion or lithæmia with true neuralgia, for the heavy character of the pain in the former instance, with scarcely any tendency to ingravescence, and its

usually bilateral situation, the nausea, languor and coated tongue, which ordinarily accompany it from the first, sufficiently distinguish it from migraine. Moreover, these attacks of gastric headache are not periodical, but arise from some error in diet, and not infrequently from catarrh of the stomach. It is hardly necessary to qualify the foregoing remark by the statement that true migraine does sometimes find its provoking cause in dietary indiscretions.

Neuralgia has been confounded with peripheral neuritis; the pathognomonic features of the latter, according to Nothnagel, are as follows:

1. The spontaneity and continuousness of the pain. Paroxysmal exacerbations are not wanting, but they are more rare than in neuralgia.

2. The peculiarly cyclical course of the attacks; the pains come on, and disappear, gradually.

3. The constant awakening or exasperation of the pain under the influence of pressure.

4. The cessation, after a certain time, of the pains both spontaneous and provoked. (This is not properly a pathognomonic sign of neuritis, seeing that it is met with in other affectious of the nerve-cords.)

5. The centripetal direction of the spontaneous or provoked pain.

6. The precocity of the cutaneous anæsthesia.

7. The appearance of trophic disturbances in the domain of the nerve; notably, alterations of the

cutaneous tegument and its dependencies (thickening of the skin, herpes, lesions of the hairs, nails, etc.). Rapid muscular atrophy would have almost the same significance.

To these signs (of varying value) Vanlair would add the following:

(*a*) The more circumscribed and direct limitation of the pain—neuritis limits itself, ordinarily, to a definite nerve, and rarely gives rise to irradiations into the extremities of the nerves; (*b*), the fixedness of the seat; (*c*), the absence of multiple painful points; (*d*,) the exaggerated excitability of the diseased nerve—in idiopathic neuralgia the nerves lose their electric sensibility; (*e*), the constant appearance of troubles of motility (when the affected nerve is a mixed nerve); (*f*), the possibility, in some cases, of feeling the swelling and induration of the nerve, sometimes even of perceiving a reddish streak visible at the surface of the skin; (*g*), the very constant presence of a traumatic cause, of the local action of intense cold, etc.; (*h*), the ordinary absence of relapses, while relapse is the rule in neuralgias; (*i*), the fever, when it exists.*

MYALGIA (muscular rheumatism) is the pain of over-fatigued muscles—of muscles obliged to work when imperfectly nourished. A familiar example is the stiff neck, or lumbago, resulting from exposure to cold, an accident especially likely to occur when the

* Vanlair, *loc. cit.*, p. 98.

individual is enfeebled by work and is perspiring; pleurodynia, or pain in the intercostal muscles, is another example of myalgia, and this affection is often mistaken for pleurisy by the laity.

Bearing in mind the distinguishing features of neuralgic pains (before given), there can be little likelihood of confounding neuralgia with myalgia. One characteristic of myalgic pains is, that they are materially relieved by change of posture and rest—by keeping the affected muscles in a position of full extension. The pains can be easily referred to the area of certain muscular groups; and if there are any tender points, these are over the tendinous origins and insertions of the muscles. Myalgic pains are aggravated by movements, and occur in persons of no neurotic tendency as often as in the neuralgic; while heredity has no marked influence in their genesis.

Spinal Irritation may be looked upon as a *myelalgia*, *i. e.*, a neuralgia of the medullary axis. Being, therefore, *per se* a member of the group of neuralgias, its diagnostic features need brief statement here. These consist in the connection of certain symptoms, or groups of symptoms, with tenderness in particular regions of the spine. Thus, when the region of tenderness is in the cervical region, there are symptoms such as headache, nausea, vomiting, face-ache, fits of insensibility, cough, pains in the upper extremities, etc. When the tenderness is in the cervical and dorsal region, there may be, in addition, pains in the

sides and in the stomach, pyrosis, palpitation, and oppression.

When the dorsal region is the seat of the spinal tenderness, there will be pain in the stomach and sides, cough, oppression, fits of syncope, hiccough, eructations. With tenderness in the dorsal and lumbar regions, in addition to the symptoms of the foregoing group, there will be pains in the abdomen, loins, hips, lower extremities, and dysuria and ischuria. With tenderness in the lumbar region principally, pains in the lower part of the abdomen, testes or lower extremities, dysuria, ischuria, disposition to paralysis of the lower extremities.*

PSEUDO-NEURALGIAS—The pseudo-neuralgias, as has been elsewhere said, owe their existence to some lesion in the region where the pain is located: *i. e.* they come on after a wound injuring a nerve or nerves, or they are consequent on some tumor, as a neuroma or a malignant growth, a congestion or some obscure diathetic condition. The intense pain

---

* This disease was first identified by T. P. Teale in 1829, "On Neuralgic Affections Dependent on Irritation of the Spinal Marrow," 1829; also by the Griffin brothers in their valuable monograph, 1844. The subject is well presented by Hammond "On Spinal Irritation," Leisure Library Series, 1886. The treatment is by restoratives and rest, nerve sedatives and analgesics; blisters over the painful points are highly spoken of. See further, Radcliffe's article in Reynold's System of Medicine.

that accompanies an ophthalmia or ulceration of the cornea belongs to this category. The pains of congestion in general, whether the nerve trunks participate in the hyperæmia, or are simply pressed upon or stretched are of this nature. The pains of pneumonia and pleurisy, of hepatitis, of cystitis, of metritis, etc., where not due to actual neuritis, belong to the same category. There is a rare painful affection called by S. Weir Mitchell and Lannois "*angio-paralytic neuralgia of the extremities*" occupying the lower extremities, the soles of the feet especially, sometimes unilateral, sometimes bilateral, which should also be classed under this head.

The pain wich attends gangrene is another instance of the kind.

The reverse of hyperæmia or fluxion, namely extreme anæmia, causes pain quite as excruciating as any neuralgic suffering, and no better example can be given than the pain following embolism of an important artery.

Wounds of nerves (by swords, knives, fire-arms, etc.) cause painful neurites which are sometimes very intractable. The symptoms of neuritis have been given above and need not here be repeated. The ordinary traumatic neuralgias appear several weeks after the lesion. They may get well, or persist long after the cicatrization of the wound. They sometimes so resemble the essential neuralgias as to be nearly if not quite indistinguishable from them. The pains

are of the same lancinating character, and there are the tender points; in many cases there is an intolerable burning sensation (causalgia), which is pathognomonic of nerve injury.

The trophic and motor troubles attending traumatic neuralgias are more severe and persistent than those attending essential neuralgia (hypertrophy, atrophy, motor paralyses). The epidermis is prone to atrophy, giving the appearance known as "glossy skin."

It is not necessary to dwell on the pains of cancer which can offer no difficulty in diagnosis.

With regard to the little painful tumor called *neuroma*, it often follows amputation of a limb, the section of a nerve, and it is attended with pain of a very intense and persistent kind. There is generally anæsthesia in the domain of the affected nerve, and the patient complains of numbness. Nothing but excision of the morbid growth does much good.

Those painful affections of the joints first described by Brodie, and known as hysterical arthropathies belong to the category of pseudo-neuralgias. Here the diagnosis, as in the true hysterical neuralgias, must be based on considerations drawn from the presence of the pathognomonic symptoms and stigmata of hysteria itself.

If visceral neuralgia be suspected, the physician will, by the proper means of exploration, exclude the presence of any organic disease.

Cerebral abscess might be confounded with neuralgia of the head. The former is sometimes a sequel of caries of the internal ear and purulent discharge, the result of scarlet fever, measles, etc., in childhood; may follow a blow on the head. There are no true "*points douleureux*," and the pain does not completely intermit; the pain is fixed, tenacious, profound and circumscribed; there are no well localized secretory or vaso-motor phenomena; the pain is usually attended by severe psychical and motor disturbances (delirium, coma, convulsions, hemiplegia) which are sufficiently characteristic of central disease.

It might be easy to mistake the lightning pains of *locomotor ataxia* for those of true neuralgia, but in the spinal disease there are symptoms denoting degeneration of the posterior root-zones; the peculiar staggering gait, the numbness in the feet, the frequent impairment of sight, the suppression of the tendon reflexes, etc. The early signs of locomotor ataxia, especially insisted upon by Dr. Marx Karger, are, besides the presence of a cord like sensation around the waist, numbness of the lower extremities, retardation of the rate conduction of sensations, the difficulty or inability of balancing the body when the feet are placed parallel or close together and the eyes are shut (Romberg's symptom), the absence of the patellar-reflex, and the want of reaction of the pupil.

As genuine neuralgia may be the result of alcoholism and mercurial poisoning, so there are certain

pseudo-neuralgias due to these poisons distinguishable, according to Erb, by their persistence, their localization in symmetrical parts of the extremities, especially in the vicinity of joints. Erb, while admitting that syphilis may produce true neuralgia, regards the osteocopic pains of syphilis as true organic pains, the result of morbid deposit about nerves, and distinguishable from neuralgic pains by their seat, their symmetrical position, and their nocturnal exacerbations.*

The limits of this treatise will not allow me to enter upon the vexed question of the diagnosis of neuralgias of central from those of peripheral origin, a matter concerning which we have still few fixed rules for our guidance.

As for the diagnosis of those neuralgiform pains which depend on an appreciable lesion of the encephalon or cord, the following characteristics (given by Vanlair) will aid in distinguishing them from idiopathic neuralgias:

1. They present an exceptional obstinacy.

2. The pain is sometimes continuous, sometimes intermittent. In the latter case, it often manifests itself as a lightning irradiation which does not follow the anatomical tract of any nerve.

3. It presents generally, when it is continous, a great fixedness.

4. These pains, unlike ordinary neuralgias, occupy a nerve in its totality, *i. e.*, the trunk of a nerve and all its

* Ziemssen's Cyclop., Vol. XI, p. 64.

branches. We have an example in the case of neuralgia of the trigeminus due to intra-cranial tumor.

5. It often invades little by little other nerves whose origin borders on that of the nerve primarily involved.

6. Pressure exercised over the region of the nerve centres corresponding to the point of emergence of the nerves, often produces a very severe pain extending to all the ramifications of the nerve.

7. Local means, *i.e.*, all those applied over the tract of the nerve, are inefficacious.*

---

* Vanlair, *loc. cit.*, p. 92.

CHAPTER VIII.

PROGNOSIS.

The prognosis is more favorable where hereditary influence is absent than where it is present.

The idiopathic neuralgias are less amenable to curative means than the symptomatic or constitutional; the latter, whether chlorotic, syphilitic, malarial, diabetic, or gouty, get well or improve as the constitutional state improves, on which they depend.

The toxic neuralgias will be likely to undergo attenuation and disappear when the toxic agent which causes them ceases to act or is eliminated.

Neuralgias accompanying grave cachectic states, from whatever cause, are relatively obstinate. None are more intractable than those of the decline of life and of old age, and neuralgias of central origin are more difficult of treatment than those of peripheral origin.

It can hardly be said that *sex* influences the prognosis.

Neuralgias of long standing with frequently repeated attacks are among the least curable.

Hysterical neuralgia is apt to be very obstinate.

Neuralgias of early life are relatively benign.

According to Gowers, neuralgias of the fifth nerve are more intractable than all others.

CHAPTER IX.

THE TREATMENT OF NEURALGIA.

PROPHYLACTIC TREATMENT.

Idiopathic neuralgia, like other neuroses, is a hereditary disease. The ancestors of the neuralgic subject—one, or more of them—were either neuralgic, or were sufferers from hysteria, epilepsy, or some other neurosis; or, the parent may have impaired a naturally good constitution by intemperance or some other vice, and so entailed on the offspring that instability of nerve-organization which, under suitable provocation, finds expression in some form of neuralgia.

There are, of course, exceptions to the rule that neuralgia is a hereditary disease; children born healthy have had their constitutions undermined by insufficient diet, by some one or more of the diseases peculiar to children (as scarlet fever or diphtheria), or even by precocious addiction to some vice.

Children who have inherited the neuralgic temperament should not be allowed to study too hard at school, and should not be subjected to physical tasks of an arduous and exhausting nature. Moderation in all things should be the rule. Such subjects are unfitted to bear a strain. At the same time,

they should be required to be much in the open air, to indulge in invigorating sports, to perform gymnastic exercises of certain kinds which can be borne without too much fatigue, to practice rowing, horse-back riding, and swimming. The cold bath or cold douche in the morning is a good auxiliary. All these hygienic measures improve the circulation and develop a strong muscular and nervous organization. Hydrotherapy especially toughens the integument and prevents the frequent occurrence of debilitating rheums.

To these means should be added a full, generous diet of meat, eggs, fish, milk, cereals, vegetables, and fruits. Very many cases of neuralgia have been traced to a meager and insufficient dietary. When we remember that neuralgia is essentially a disease of malnutrition, and that nerve substance is a conglomerate of richest animalized principles (phosphorized oleo-albumen), we see that we must place in the foremost rank of remedial agencies those means which improve or restore the nutritive functions.

Some of the worst forms of migraine, prosopalgia, etc., that I have ever seen were among the poor and ill-fed. For delicate, half-starved children, brought up in slums and crowded tenement houses, there can be but little hope; out of these breeding places of disease, come the multitude of the hysterical, the neuralgic, the nervously shattered, who float about between the hospital and the alms-house.

The neuropathic child should be taught the necessity of plenty of sleep. Too much emphasis cannot be placed on this requirement. Eight, even ten hours sleep a day is not too much. Those predisposed to neuralgia should be compelled to go to bed early—between the hours of nine and ten every night, and all evening excitements should be forbidden. Among the latter should be mentioned the reading of dime novels.

As everything that favors the precocious development of the passions is bad, the evil influence of corrupt companions is to be deprecated and avoided by every possible means. It is, however, a matter of great difficulty for the parent or guardian always to avert such influences, for the cousin or class-mate of the moral and "goody" sort is often the one who in secret instils the poison and corrupts the nature of the child.

Doubtless the evils of masturbation, as practiced by children, have not been too highly painted. The neuropathic child cannot be too early, too earnestly, or too faithfully warned against the pernicious effects of this vice.

PROPHYLAXIS IN THE ADULT.

The adult, who, by faulty organization, by debilitating influences, by previous attacks of neuralgia, is predisposed to this neurosis, demands essentially the same prophylactic hygiene as has been above out-

lined. He should possess some light, healthy employment, and avoid occupations that involve arduous toil and great anxiety. Good, nutritious food at regular seasons should be eaten, and alcoholic and other stimulants eschewed; the neuralgic should also religiously refrain from smoking. These patients are prone to seek excitement, and often suffer a breakdown in consequence. One patient with whom I was acquainted, used invariably to experience a return of her megrim after going to an evening party or a ball. Such persons are uncommonly vivacious under excitement, and endure well the strain for the time being. They are, however, capable of using up in one evening's dissipation all their reserves, and of bringing their nerve-centres into a state of unnatural erethism that weeks of rest may not calm.

The condition of these sufferers is often deplorable. Of fine literary and æsthetic tastes, they cannot long enjoy reading, artistic pursuits, etc., without paying the penalty in an attack of severe orbital or supra-orbital neuralgia. One of my acquaintances cannot read an hour consecutively without twinges of pain through his temples, which oblige him to desist. He regards himself as shut out from the best enjoyment of life; is gloomy and suicidal. Persons of this temperament need an especially fortifying regimen; of which life on the sea (yachting), in the woods, among the mountains, with absolute freedom from brain work, shall form the principal part.

Some writers (as Vanlair and Anstie), have found excessive religiousness a factor in the genesis of neuralgia; but doubtless an ardent espousal of the most gloomy theological beliefs is less harmful than the indulgence of depressing vices, or the cultivation of voluptuous appetites.

The same remarks that have been made about sleep, are applicable to the adult neurotic, who should have regular habits of sleep, and whose sleep should be long and sound. If he happens to be a poor sleeper, he should endeavor to woo tired Nature's sweet restorer, by taking much exercise in the open air, and especially diverting exercises, by cold bathing in the morning, and the warm bath just before going to bed, with vigorous shampooing of the body, along with the sipping of a cup of hot water containing some mild cordial, as spirits of lavender, or even a little Fluid Beef; this is far better than resorting to any of the ordinary hypnotics, as chloral and sulphonal, which are sure, in the end, to leave the nervous tonus damaged. It is only exceptionally that I would allow a neuropathic patient to apply to any of the so-called hypnotics for relief. Where a small dose of whisky, or a glass of bitter ale will produce refreshing sleep, this is safer than chloral or a narcotic. Sometimes it makes a great difference what the victim of insomnia eats for his supper, and there are all sorts of idiosyncrasies in regard to this. Some persons will sleep better with

a full, some with an empty stomach. To some patients your best prescription is a supper of hominy and milk; to others, a light lunch, or cup of beef-tea on going to bed; a full dose malt extract.

Above all things, the neuralgic invalid should have a mind at ease, for anxiety, care, worry, overmastering passions, are the greatest foe to healthful sleep.

As adjuvants to a cure, there are certain tonic medicines which deserve mention here: Quinine, strychnine, iron, arsenic, and a very moderate amount of some of the fermented liquors, wine and beer. To the anæmic, iron and arsenic are especially useful; a good combination is the *iron, arsenic and strychnia pill*, furnished by a number of our pharmacists.

Fothergill's pill is a good stomachic tonic. Its formula is as follows:

℞ Acid arseniosi, gr. j.
Ferri sulph. excic, ʒ ss.
Pulv. capsici, ʒ j.
Pil. aloes et myrrh, q. s.

M. Ft. pil. No. LX.
Sig. One pill three times a day.

A pill of dried sulphate of iron, aloes and myrrh, 1 grain each, sometimes works well in chlorosis accompanied with constipation. The same may be said of the well known sulphate of iron, sulphate of quinine, and sulphate of magnesia mixture.

Or five minims of Fowler's solution may be associated with ten grains of bicarbonate of sodium and five of potassio-tartrate of iron in a fluid ounce of infusion of quassia; this dose to be given after each meal.

Arsenic is one of the best anti-neuralgic remedies that we possess. According to Anstie, it is especially useful in the visceral neuralgias. With arsenic, cod-liver oil may often be conjoined to advantage. More satisfactory results will be obtained from the pure oil, when it can be borne, than from any of the emulsions, of all of which, according to my experience, patients soon tire. Too much care cannot be taken that the oil shall be perfectly sweet and fresh.

A course of electric treatment (galvanism preferably to Faradism), sometimes works well; both by calming the erethism of the nerve centres, and promoting the nutrition of the latter. The electrical treatment of neuralgia will claim especial consideration in another chapter.

Treatment of Diatheses which lead to Neuralgia.—Neuralgia is sometimes under the dominance of a diathesis, such as gout, chlorosis, rheumatism, hysteria, diabetes. The treatment which is devoted to the diathesis is the proper treatment of the neuralgia.

Neuralgia of Toxic Origin.—Neuralgia may be dependent on a poison in the blood; lead, mercury,

arsenic, alcohol, malaria. Here the leading indications are: 1, To suppress, then antidote, then promote elimination of the poison; 2, as far as possible to protect the organism from the effects of the toxic agent, and palliate symptoms as they may arise. It is evident that when the proper antidote can be administered, this is the remedy *par excellence* for the neuralgia. In malarial neuralgia, for instance, quinine in large doses is indicated. In alcoholic neuralgia, suppression of all alcoholic stimulants should be strictly enjoined. In nicotinic neuralgia, tobacco should be abstained from. In colica pictonum, the proper treatment of lead poisoning will also cure the neuralgia.

Reflex Neuralgias.—These neuralgias are due to a localized morbid state (of the uterus, kidneys' etc.) and the successful treatment of the suffering organ will cure the neuralgia.

Surgical means of cure.—Neurotomy, neurectomy and nerve stretching have all been practised for the cure of intractable neuralgia. Nerve stretching has been principally applied to sciatica, and neurectomy (which has given some brilliant results), to the treatment of prosopalgia.

Treatment of Neuralgic Paroxysms.—When you are in the presence of an attack of neuralgia, the first thing, of course, to do is to relieve the pain. It is desirable, if possible, to obtain analgesia without resorting to morphine. In many of the neuralgias, such

as migraine, and those of central origin, whether idiopathic or symptomatic, antipyrin often gives speedy, marked relief, fifteen grains being followed by complete disappearance of the pain. A repetition of the same dose in the course of a few hours, and a continuance of this treatment for several days, the antipyrin being given often enough to keep the pain under subjection, may be all that is required, the patient being as far as possible removed from the reach of causal influences. This is Germain Sée's treatment of the headaches of students, headaches which often oblige matriculants to suspend study for weeks or months. Acetanilid, in half the dose of antipyrin, may be attended with an equally good result, and the same may be said of phenacetin, which is coming into general favor. Lately exalgin has been well spoken of; it has been praised as an anti-neuralgic by Dujardin-Beaumetz and Bardet.

I must express my own partiality for phenacetin, which I have found hypnotic as well as analgesic.

I have also seen good results from acetanilid in neuralgic headaches. In cervico-brachial, dorso-lumbar, and sciatic neuralgia, I have seen no benefit from any of these new remedies except phenacetin. Citrate of caffeine and guarana are remedies from which much good may be expected in hemicrania, and always where the pain seems to be the consequence of nerve tire. The dose of caffeine is three or four grains, of guarana twenty grains.

The following prescription, for which I am indebted to the late Dr. George M. Beard, has given good results in headaches of all kinds:

℞ Cit. caffein.....
Carb. ammon.....ää ʒj.
Elixir guaranæ..... ..... f ℥ j.
M. Sig.—A teaspoonful every hour till the pain is relieved.

Some of my patients, delicate, migrainous patients, keep a bottle of citrate of caffeine constantly on their toilet tables; a frequent resort to it keeps them free from headaches. I have never seen any harm result from the continuous use of this drug.

Bromo-pyrin and Bromo-caffeine are two proprietary medicines whose efficacy depends on the antipyrin and caffeine which they contain.

Aconitine, in pills of $\frac{1}{200}$ grain, one pill every five hours till the supervention of the physiological effects, or till the pain disappears, sometimes has a charming effect in migraine and tic douloureux.

In face-ache, especially when due to a decayed tooth, the tincture of gelsemium in five-drop doses, every two hours, is often followed by speedy subsidence of the pain. I have always found gelsemium in this dose to be a perfectly safe remedy.

Some practitioners have great faith in a full dose of quinine (fifteen grains) in neuralgias of the peripheral nerves, whether due to malaria or some other cause. I cannot say that I have ever found this alkaloid beneficial in neuralgic paroxysms, except where

the attack was clearly of malarial origin. Gross' neuralgic pills, in which quinine is combined with aconite, strychnine and morphine are, I think, chiefly of use as a prophylactic where attacks have been frequent.

As outward applications, chloroform liniment, veratrin ointment, extract of belladonna rubbed up to a paste with water, spread on cloth and applied over the seat of pain, have had their advocates. No external means can be relied on. Anodyne embrocations are more useful when the pain is rheumatic than when it is neuralgic.

Hypnotizers claim to have accomplished wonderful results by putting the neuralgic sufferer into the hypnotic sleep, and assuring him that the pain no longer exists. As nothing is impossible, *à priori*, and all things are to be believed on sufficient testimony, we have now adequate warrant for a certain faith in hypnotism as a means of cure. Bernheim's book on "Suggestion as a Therapeutic Agency" contains a number of instances of severe neuralgic and neuralgiform pains cured by hypnotic suggestion.*

It will often happen that none of the above means

---

* It cannot but be admitted, however, and good clinical authorities are coming to see this, that the frequent repetition of hypnotic practices is likely to be promotive of hysteria. Germain Sée declares that to relieve pain by hypnotism and to render the patient hysterical thereby, is to cast out Satan by Beelzebub.

are applicable to the case in hand, or, if tried, they have resulted in failure. There is nothing to do then, but to resort to a hypodermic injection of morphine. The tablet triturates of the pharmacists are very handy for this purpose. The commencing dose should be the sixth of a grain. If no relief is obtained, the njection may be repeated in fifteen minutes or half an hour. In bad cases of tic douloureux, migraine, visceralgia, I have often had to repeat these injections every half hour until a grain, a grain and a half, and even two grains have been administered. Severe pain creates great tolerance of morphine. I have seen a delicate neurotic girl in a paroxysm of cervico-brachial neuralgia bear with impunity a quantity of morphine introduced subcutaneously that would have killed a strong, well man. There is not the same tolerance of atropine, and it will not do to push the injections of this alkaloid. If, for the first injection, one of the morphine and atropine tablets be used, in the subsequent injections the atropine should be omitted. The dryness of the mouth and throat that follows a full dose of atropine gives the patient great annoyance and discomfort.

For ordinary hypodermic use I employ a solution of morphine, consisting of four grains of sulphate of morphine to a fluidounce of cherry-laurel water. Of this, a hypodermic syringeful may be injected with safety to an adult. The cherry-laurel water keeps the solution from spoiling.

Inject into a fleshy part of the arm; there is no advantage in injecting over the seat of the pain.

Deep injections of chloroform sometimes as effectually relieve the pain as morphine injections. For sciatica, take up a syringeful of pure chloroform and inject it the depth of the syringe-needle into the gluteal muscles.

Antipyrin may also be used hypodermically. Dissolve eight grains in a hypodermic-syringeful of warm water, and inject the whole into a fleshy part of the arm or thigh. Germain Sée highly commends this use of antipyrin.

CHAPTER X.

APPENDIX.

A more particular mention of the principal agents of the anti-neuralgic medication seems required; they will be considered in this supplement.

I. NARCOTICS.

These remedies are nerve-stupefiers. If they fail to combat the cause of the neuralgia, they at least attenuate the painful paroxysms by an elective action on the sensory centres, whose erethism they calm. The remedies to be considered under this head are: Opium, belladonna, Indian-hemp, hyoscyamus, piscidia, gelsemium, and aconite.

OPIUM.

OPIUM.—While opium is not the *best* analgesic for neuralgic pains, and is certainly to be avoided as far as possible, it is the most powerful antagonist of pain that we possess, and after all other remedies have failed, the physician is obliged to fall back on this incomparable anodyne.

Mode of Action.—Opium is a true protoplasmic poison. In proper doses, it suspends those molecular changes on which life depends. It acts on the cortical cells of the cerebrum as a stupefier, diminishing reflex excitability and allaying pain.

Indications and Contra-indications.—In all the cerebro-spinal neuralgias, opium or its alkaloids may be indicated. Certain idiosyncrasies, however, may forbid its employ, as where nausea and vomiting, vertigo, epigastric anguish, dysuria, attend the therapeutic use of any opiate. Some patients are so prostrated by opiates that they will suffer almost any degree of pain rather than resort to them.

According to Vanlair, opium is better adapted to the treatment of the *visceralgias* than the cerebro-spinal neuralgias, and acts better in *lymphatic* than in nervous subjects.

Modes of Administration and Doses.—Opium may be employed externally in the form of liniments, ointments, and plasters. The *linimentum opii* contains equal parts of laudanum and opodeldoch. The *emplastrium opii* has opium and Burgundy pitch. In the French Codex is a *glycerite of morphia:* 2 grains of morphia to an ounce of glycerin. All these may be used for local effect, or the aqueous extract may be

rubbed up with water and applied in compresses. The decoction of poppies has sometimes been used as a local anodyne. It must be confessed, however, that no great benefit can be obtained from these external applications.

Crude opium is seldom given internally for neuralgias, and the same may be said of the fluid preparations. The *vinegar of opium* (English black drops) has a certain reputation in gastralgia; dose, 10 drops.

The only alkaloid of opium deserving of mention in connection with the therapeutics of neuralgia, is morphine. This alkaloid may be given internally in the dose of a quarter of a grain, every hour or two, until the pain is relieved. The better method of administration, however, is the hypodermic method. One-fourth grain of morph. sulph., or ten minims of Magendie's solution may be injected into the cellular tissue of a fleshy part of the arm; the effect will be far more speedy and lasting than when the alkaloid is given by mouth. Moreover, only about half the ordinary dose is needed when the morphine is injected, a quarter of a grain thus introduced having about the same effect as half a grain taken by the mouth.

Morphine may advantageously be combined with atropine for hypodermic use, as in the tablet triturates sold by the apothecaries.

There is no need at the present day of insisting on the advantages of hypodermic medication; all practitioners recognize the superiority of this method over every other when it is a question of obtaining the maximum of effect with the minimum dose.

Nor is it necessary to speak of the endermic method, now superseded by the hypodermic.

Chlorodyne—Chloranodyne.—How to obviate the injurious after-effects of morphine when this alkaloid is administered for pain, has long been the study of physicians. Experience has taught many a practitioner that the combination with aromatic stimulants, as peppermint, lavender, cajaput, was often useful; many claimed that they had found in capsicum and ginger the desideratum; some wanted the advantage of a union of the opiate with alcohol, chloroform, or various narcotics and sedatives, such as belladonna and hydrocyanic acid. When I was an interne of the Montreal General Hospital, in 1864, Collis Browne's chlorodyne was much in vogue. Although its composition was uuknown, no one doubted that the active anodyne ingredient of this preparation was morphia.

In my subsequent private practice I was much in the custom of resorting to this chlorodyne (notwithstanding its high cost) when obliged to give morphia to patients who were in the habit of experiencing unpleasant results from the drug when given alone. I found it, however, an uncertain preparation, apt to spoil by precipitation of the molasses, which was the vehicle of the active ingredients; and about seven years ago I abandoned the Collis Browne Chlorodyne for Gilman's, the formula of which I found in the Boston Medical and Surgical Journal:

℞ Chloroform, ʒ ij.
Glycerine, ℥ ii.
Alcohol, ℥ ii.
Spts. peppermint, ʒ ij,
Acid hydrocyanic dilute, ʒ ij.
Tincture capsicum, ʒ ij.
Morph. sulph., gr. viii.
Syrup, ℥ iii.
M.

The dose of this preparation for an adult is one teaspoonful, which contains one-eighth grain morphia,

The above combination is a good one, the ingredients being all held in solution, and the taste being far less unpleasant than the nasty, tarry-looking compound generally sold under the name of chlorodyne.

Despite the fact that I have long used, and almost daily in my practice, the Gilman chlorodyne, I find in the preparation devised by Parke, Davis & Co., and sold under the name of Chloranodyne, a more efficient and elegant combination. I do not hesitate to say that nothing as yet made is quite so satisfactory. The dose is about the same as the old Collis Browne article, while the action is more certain. The smallness of the dose (15 to 20 drops) is an advantage over the Gilman chlorodyne, which must be given in drachm doses and is about equally expensive.

The formula of Parke, Davis & Co.'s chlor-anodyne shows each gramme to contain the following ingredients in the quantities indicated:

℞ Morphia muriate....	.0060 grm.
Tinct. Cannab. Ind.....	.0800 grm.
Chloroform.....	.1350 grm.
Oil of peppermint.	.0025 grm.
Tinct. capsicum.....	.0025 grm.
Hydrocyanic acid dilute.... ..	.0170 grm.
Alcohol.....	.3000 grm.
Glycerine	.4570 grm.

BELLADONNA.

"The anti-neuralgic action of belladonna," says Vanlair, "is not dependent on its physiological effects, for belladonna is an excitant of the central cells, and its stupefying properties do not appear till after an intense and prolonged excitation. If we were to consider pain as a simple exaltation of the sensibility, the efficacy of belladonna in the treatment of neuralgias would be absolutely inexplicable. * * * But pain, not being hyperæsthesia, there is nothing to prevent belladonna, even when it does not exert its stupefying properties, from acting against the algesic element and triumphing over it. Belladonna is even superior to opium in certain respects. It not only manifests an incontestable *anodyne* action, but it also exerts anti-neuralgic properties which opium does not possess to the same degree."

Vanlair thus expresses his preference for belladonna over the other narcotics as an anti-neuralgic, and whatever we may think of his explanation he here seconds views before uttered by Behier, Courty, and Trousseau. The kind of neuralgias which he thinks most amenable to belladonna are "the idiopathic, and especially those affecting nerves placed superficially. Such are the facial neuralgias, and especially those of the supra-orbital branches; the temporal neuralgias yield equally well, but neuralgias of the infra-orbital nerves are more stubborn." * * * In the above neuralgic affections, he would rely much on local applications of belladonna. The dose of the alcoholic extract and the powder of the leaves is one-fourth of a grain twice or three times a day. Outward applications over painful regions of the extract, rubbed up with water, or of cataplasms of the leaves, are sometimes of unquestioned efficacy. Trousseau counselled to make a paste of the extract with a few drops of water, and rub it over the painful part. He has found this treatment of efficacy in sciatica. Vanlair prefers an ointment made by rubbing up half a drachm to a drachm of extract of belladonna in an ounce of lard, vaseline, or glycerite of starch.

Trousseau's Treatment of Migraine.—He makes a quantity of pills of the extract of belladonna, each containing one-sixth of a grain; one of these is given every hour (cautiously) till the complete disappearance of the pain, or till some vertigo is felt.

Atropine, the alkaloid of belladonna, has been much

given in neuralgia.* The dose would be one-hundredth of a grain, which should not be repeated more than three times in the twenty-four hours. Atropine is preferably given by the hypodermic method; one of the $\frac{1}{100}$ grain tablet triturates being dissolved in fifteen drops of water and injected subcutaneously. In obstinate idiopathic cerebro-spinal neuralgias it will not do to rely on this alone; the atropine works more speedily and effectually if combined with morphine. Thus:

℞ Sulphate of morphine, ¼ grain.
Liquor atropia, 2 drops.
Cherry laurel water, 20 drops.
M. For one hypodermic injection.

Or the tablet triturates may be employed. Each contains one-fourth grain of morphia, and one-hundredth of atropia.

It is hardly necessary to add that belladonna is not in quite the same repute in which it was held some years ago, before the antithermic analgesics and caffeine were introduced into therapeutics. The dose both of belladonna and of its alkaloid required for the complete relief of pain can hardly be regarded as a *perfectly safe dose;* at any rate this powerful drug demands skilled and experienced management for its successful employ.

CANNABIS INDICA—(HASHISH—INDIAN HEMP.)

Indian hemp, much inferior to opium as an analgesic, has been found serviceable in some cases of migraine. Ringer declares that no single drug has been found so useful in this common neuralgic affection. It should be given for weeks and even months in doses of ⅓ to ½ grain twice a day.

Greene, an English practitioner, was one of the first to make of hashish a sort of specific against migraine. He gave of the alcoholic extract of Indian hemp from 0.02 to 0.03 (⅓ to ½ grain) before each meal; after several weeks he increased the dose somewhat, and continued the treatment for three months. It is especially in the migraine of young people that Indian hemp does good.

Seguin, in the *Medical Record* (vol. xii, p. 774, 1877), recommends the same treatment, and insists that the doses shall be given with the greatest regularity. The principle is

*According to Anstie, atropine is particularly useful in glaucomatous neuralgia, and in neuralgia of the pelvis.

to keep the nervous system steadily under a slight influence of cannabis for a long period of time. He says that cannabis is nearly as efficacious in migraine as the bromides are in epilepsy. Male patients can generally begin with half a grain, and it is well to give them three-quarters of a grain in two or three weeks.

Lothrop, in a paper read before the Buffalo Medical Club (*Medical Record*, vol. xix, p. 99), advocates Greene's and Seguin's method. It is stated as a matter of course, that at first no appreciable effect is observed, and that not until the use of the remedy is persevered in for many weeks will the patient find a decided diminution in the severity and frequency of the attacks Lothrop gives a fourth of a grain of the alcoholic extract before each meal for the first fortnight, then a third of a grain for the second fortnight, to be augmented to half a grain at the end of four weeks. Corrigan reports favorable results from tincture of Indian hemp in tic douloureux; he employs the tincture in the dose of 8 to 30 drops.

HYOSCYAMUS.

This narcotic agent is little employed in neuralgia, the analgesic effects obtained from *safe* doses of the various pharmaceutical preparations of henbane being too feeble. Meglin's pills, which have considerable repute in neuralgia contain extract of hyoscyamus. The composition is as follows:

℞ Oxide zinc,
Ext. valerian,
Ext. hyoscyamus, ää gr. j.

For one pill. To be given three times a day.

Hyoscyamus leaves, bruised and steeped and applied as a cataplasm to the skin in superficial neuralgias, have been vaunted by Trousseau and Pidoux.

CONIUM MACULATUM.

The same remarks are applicable to conium or hemlock. The *succus* conii, however, anciently had a reputation for the cure of *tic douloureux*, in the dose of 30 drops three times a day. The conium plaster, and cataplasms of hemlock leaves have been recommended for outward application.

STRAMONIUM.

The leaves of stramonium have been similarly used as an application to painful parts. A good way is to mix a quantity of the dried and pulverized leaves with the ingredients of an ordinary poultice.

PISCIDIA ERYTHRINA.

This plant is known under the name of Jamaica Dogwood. Introduced into medicine as a hypnotic and narcotic, it has been found to possess analgesic properties similar to gelsemium. It is especially in rebellious facial neuralgias that it has been prescribed.

Preparation and doses.—The fiuid extract is alone prescribed in the United States, in the dose of a teaspoonful.

GELSEMIUM SEMPERVIRENS.

This plant, known as the *yellow jasmine*, has real analgesic properties, and has been especially useful in facial neuralgias and in hemicrania. Perhaps its efficacy is more marked in dental neuralgia than in any other form of pain. Gelsemium is a direct paralyzer of the sensory conductors in the cord.

A severe case of cervico brachial neuralgia which came under my observatioa in 1876–1877 was markedly benefited by this drug. On numerous occasions I saw violent paroxysms yield to five drop doses of a saturated tincture. This patient (a young lady of highly neuropathic organization) was kept in comparative comfort for more than a year by the gelsemium.

The dose is from 2 to 10 drops of a saturated tincture, or of the fluid extract, which may be cautiously repeated every hour or two till abatement of the pain is produced.

ACONITE.

We do not believe that aconite in the form of tincture or extract,* is of much service in neuralgia, but there is no doubt as to the utility of its active principle *aconitia*.

---

*The extract of aconite is, however, a principal ingredient of the somewhat famous neuralgic pills of the late Professor Gross, of which the formula is as follows:

℞ Ext. aconite, gr. ¼.
Quiniæ sulph., gr. ij.
Acid arsenios, gr. 1–20.
Strychnia, gr. 1-20.
Morphia, gr. 1-20.
M. One pill.

Aconitia (which exists in the root of the aconitum napellus in the proportion of about one drachm to twenty-six pounds) has been made the subject of special study by the late Prof. Gubler, whose monographs on this medicament are of great practical utility. Gubler was one of the first to insist on the importance of this remedy in the treatment of trigeminal neuralgia.

Aconitia is found in commerce under two distinct forms; the amorphous and the crystallized. The latter, which is somewhat stronger and more reliable, is the best known, and is generally prescribed under the name of Duquesnel's aconitia.

Not to dwell on the toxic effects of this powerful alkaloid, which is only safe in very minute doses, we may sum up its therapeutical actions by the observation that it seems to have a special selective influence on the extremities of nerves of sensation, which it paralyzes. This elective affinity is especially manifest in the case of the fifth pair of nerves.

The beneficial effects of this medicament in neuralgia, in facial neuralgias in particular, have been attested by a multitude of observers, among whom we may mention Oulmont, Seguin, Franceschini, Merck, and Laborde.*

Gubler is fond of narrating an incident which occurred in his practice. It concerned a patient on whom Nélaton had practiced resection "of all the branches of the tri-facial" (!). The pains continued to be just as atrocious and just as persistent as ever. The patient, reduced to despair, and ready to commit suicide, was treated by Gubler with aconitia. Seven milligrammes a day of Hottot's aconitia were administered in granules with the most marked relief, and by perseverance in this remedy a complete cure was effected.

Laborde, in the *Journal de Therapeutique*, publishes reports of six cases of neuralgia mostly of the fifth pair, in all of which marked benefit was received from aconitia; in some the benefit was permanent. In all these cases the medicine was given by mouth. He makes use of the granules of Duquesnel, containing one-fourth of a milligramme. One granule is a sufficient commencing dose, and he advises that the dose should not be repeated under four hours. Generally the second granule will give relief, if the first fails to benefit.

---

* See especially the exhaustive articles of Laborde in the *Journal de Therapeutique*, and *Tribune Medicale*, 1881.

A safe and efficient way, which we have often tried, is the following, which is in accordance with the directions laid down by Dujardin Beaumetz: Duquesnel's aconitia is ordered—the one-fourth of a milligramme granules. Of these the patient is ordered to take one granule every three hours, till eight have been taken during the twenty-four hours. It is seldom that there is any occasion to go any further. Generally the second or third dose causes complete disappearance of the pain. Given in this way, we do not exceed two milligrammes a day. If this dose not not relieve, it is vain to push the remedy further. Sometimes after the second or third granule, a little tingling of the tongue and pricking of the skin of the face, with constriction of the mouth are experienced. Patients sometimes complain that their head feels "hoop-bound" for a time.

There is no doubt about the superlative excellence of this medicament in all so-called congestive neuralgias, and we have notes of obstinate cases of sciatica which have proved amenable to treatment by aconitia. It is one of the remedies that should be first tried in severe sciatica and lumbago *a frigore*.

Even in the case of symptomatic facial neuralgias, as well as protopathic, the pain is often alleviated by aconitia, as Laborde has shown.*

II. Anæsthetics.

The only anæthsetics that will be here mentioned are chloroform, ether, nitrite of amyl, chloral, cocaine, bromide of potassium, and menthol.

These remedies abolish sensibility, but their action is fugacious, and temporary, therefore they are only to be resorted to as palliatives, and as adjuvants to the other analgesics.

---

* From an article by the author in the *Medical Record*, July 14, 1883. The following formulæ are taken from the *Formulaire Pratique*, by Dujardin-Beaumetz:

℞ *Liquor Aconitiæ* (Turnbull),
Amorphous aconitina, 1 gramme (15 grains),
Alcohol, 8 grammes (3 ii).

M. For frictions over the face in prosopalgia.

℞ Sulphate quinine, 0 gr. 20 centigrammes,
Crystalized nitrate of aconitia, 0— ¼ milligramme,
Ext. cinchona q. s. for one pill.

Take one to three of these pills in the 24 hours.

Chloroform, Ether.—Anæsthetics sometimes render service in alleviating the violence of neuralgic paroxysms. There are cases where every remedy seems to fail; the patient is racked with an atrocious migraine, tic-douleureux, or cervico-brachial neuralgia. Morphine has been given hypodermically up to the point of danger, or very near to this point, and still the persistent, boring pain continues, with frequent stabs and darts, and the poor patient can get no rest. Here the free inhalation of ether will for a time attenuate the distress. The effects are generally fugitive; nevertheless, the anæsthetic may be "the last straw that breaks the camel's back," and the paroxysm may yield to a few whiffs of ether or chloroform.

Of the two, chloroform is the most prompt and thorough in its action, producing less nausea and vomiting afterwards, but ether is generally preferred, being safer.

Lately, deep, parenchymatous injections of pure chloroform (20 to 30 drops), have been recommended (Roberts Bartholow, Ernest Besnier, Dujardin-Beaumetz, etc.), in sciatica. The needle should be plunged deeply into the muscular interstices. These injections are painful, but frequently markedly efficacious I have injected the amount of a teaspoonful of pure chloroform into the deltoid in a case of cervico-brachial neuralgia; the result was satisfactory. * * * Chloroform has been also used locally as a liniment, over painful regions, and with good results.

One of the uses of sulphuric ether may be here mentioned. If sprayed over a painful region—a common hand atomizer, such as is made by Codman & Shurtleff, Boston, which throws a continuous spray, being used for the purpose—an intense refrigeration is produced, which benumbs the nerves and for a time allays the pain. These pulverizations are of considerable use in dermalgia, in occipital, temporal, and intercostal neuralgia, and I have known them to be used with benefit in sciatica.

NITRITE OF AMYL.

Nitrite of amyl has been used with some success by inhalation (three or four drops on a handkerchief or the palm of the hand) in facial and intercostal neuralgias and in hemicrania. Most authorities, however, place very little reliance on it. From the vaso-motor paralysis and the congestions which it occasions, it is likely to do more harm than good. Vanlair thinks it of remarkable efficiency in sympathetic headaches.

CHLORAL.

Chloral has but feeble analgesic properties. It is never given in neuralgias of any kind except as an adjuvant to morphine, to calm reflex excitability and produce sleep. The dose is from 10 to 30 grains.

For external use a liniment is prepared called the *camphor-chloral liniment*, by rubbing gum camphor with hydrate of chloral. An oily liquid is the product, which, when rubbed over the seat of pain in pleurodynia, cervico-brachial neuralgia, lumbago, etc., causes first some smarting and redness, then considerable local anæsthesia.

CROTON-CHLORAL.

This substance seems to possess analgesic properties superior to those of chloral. *Per contra*, it is not so good a hypnotic. It has given good results in facial neuralgia and in migraine. The dose is five grains; Seguin counsels to give 15 grains every hour, for four doses, in migraine.

Not much can be expected of this remedy, although Dr. B. W. Richardson (*Braithwaite's Ret.*, Part 83. p. 228) speaks highly of its employment. He says: "Looking upon neuralgia as a form of vascular spasm in tracts of nerves (?), we have a clear idea of the reason why antispasmodics are so useful in some forms of this disease. * * * * The alcohol in port wine has for this reason obtained its reputation for the relief of tic. In croton-chloral combined with quinine we have an instant remedy more effective than alcohol. * * The formula is:

Croton-chloral, gr. ii.
Quinine, gr. ii.
Glycerin, as much as suffices to make a pill.

The pill to be taken when the attack threatens, and to be repeated every two hours till relief is obtained."

BROMIDE OF POTASSIUM.

Peter relates a case of cure by bromide of potassium of an epileptiform neuralgia of the face; the patient, aged 62 years, had more than 200 crises in the twenty-four hours, and could only get relief from his pain by taking half-drachm doses of bromide three times a day.*

* *Bull de Therap.*, Oct., 1876, p. 337 (cited by Vanlair).

Anstie* would limit its use mainly to a class of neuralgics, especially women, in whom a certain restless hyperactivity of mind, and perhaps of body also, seems to be the expression of Nature's unconscious resentment of the neglect of sexual functions. Bromide of potassium, on the other hand, is injurious in young men exhausted by masturbation.

OIL OF PEPPERMINT—MENTHOL.

Menthol is a solid crystallizable substance deposited from the oil of peppermint. It is also found in commerce under the name of Japanese oil of peppermint. Oil of peppermint and menthol are supposed to have anodyne properties when applied externally, but probably their therapeutic action depends on their rapid and complete evaporation. Oil of peppermint has been much used as a liniment in superficial neuralgias. A solution of menthol in alcohol, and menthol cones, have also been found of some use, especially in migraine.

COCAINE.

Cocaine is an alkaloid obtained from the leaves of erythroxylon coca. The marked local anæsthetic effects which have been obtained from this agent, and which have of late rendered it so indispensable in ophthalmic surgery, and in minor surgical operations, have led to its employment as a topical application in neuralgias. Unfortunately its action is too superficial and too transitory. A strong solution rubbed over painful nerves, or applied on tampons and compresses—in tic douloureux, in migraine, in intercostal and other peripheral neuralgias—gives but momentary alleviation.

Hypodermic injections, each injection consisting of a syringful of the two per cent. solution of the hydrochlorate of cocaine—have been used in neuralgia, with some benefit. In one instance of severe cervico brachial neuralgia, where I frequently resorted to these injections, the anagelsic effect was speedy, and lasted several hours. At the same time, some observers have recorded among the unfavorable symptoms attending the subcutaneous use of cocaine, nausea, and even alarming syncope.†

---

* Anstie, "On Neuralgia," p. 241.
† Dujardin-Beaumetz, New Medications, Am. Ed., p. 300.

From my own limited experience I should say that if the patient be kept in a recumbent position, there is little danger of syncope, and that the occasional use of cocaine subcutaneously in neuralgia, as a substitute for morphine, is advantageous.

III.—Neurosthenic or Alterative Medicaments.

The medicines above enumerated do good chiefly by an action directed to the element pain, and their effect is more or less transient. Moreover, some of them, as opium, are objectionable in that the organism is likely to be in a worse condition after their use than before. He who is obliged constantly to resort to morphine injections is almost certain to become a morphiomaniac. Nor can it be said that the constant use of belladonna, cannabis, or any other narcotic is unattended with injury to the organism.

Perhaps the same objection is not (at least to the same extent) applicable to a class of medicines which I may call neurosthenic or alterative medicaments, which are designed to strengthen the nerve element. Of this class I shall notice only the principal: Arsenic, quinine, salicin, iron, phosphorus, chloride of ammonium, strychnia, and cod-liver oil.

ARSENIC.

Perhaps no remedy is more prized at the present day in anæmic neuralgias than arsenic. This medicine, says Anstie, "from its singularly happy combination of powers as a blood tonic, a special stimulant of the nervous system, and withal, as a special opposer of the periodic tendency, must be regarded as one of the most powerful weapons in the physician's hands, and although it seems to act best in the neuralgias of the vagus and the fifth, there is a possibility of its proving the most effective remedy in almost any given case which may come before us." Anstie has seen especially good results from arsenic in the paroxysms of angina pectoris; from his description it would appear that he refers to those purely neurotic forms of cardiac pain called by Huchard *false angina pectoris.*

Cohen* has administered arsenic with success to persons affected with all kinds of cerebro-spinal neuralgias, facial, sciatic, intercostal, etc. Sciatica has been the most refractory to this remedy. Leared has found it very efficacious in gastralgia.

---

* *Journal de Mèdicini de Bruxelles*, 1865. (Cited by Vanlair).

Doses and mode of administration.—1, Fowler's solution, three drops, gradually increased to eight or ten, after each meal. 2, Arsenical pills $\frac{1}{60}$ to $\frac{1}{30}$ grain; one pill three times a day. The granules of Dioscorides and the Asiatic pills are ancient preparations. Fowler's solution can generally be tolerated if any arsenical preparation can be taken, but in some patients arsenic in every form is contra-indicated, owing to gastro-intestinal irritability.

QUININE.

Quinine has a great reputation in the treatment of neuralgia, a reputation which is largely due to its success in those forms of neuralgia which are of malarial origin. There is no doubt as to its utility in these latter neuralgias. The dose should be large, from 10 to 15 grains to an adult; this may be given to best advantage a few hours before the paroxysm; Stillé says six to eight hours.

Numerous examples of the efficacy of quinine in neuralgia of the ulna, sciatic, crural, and other nerves have been given by Dr. Hanfield Jones.* A case of femoro-popliteal neuralgia was cured by Duprè with quinine after other remedies had failed, and Brodie successfully treated neuralgia of the inferior dorsal nerves by the same remedy.† Anstie ascribes to it a special value in the treatment of ophthalmic neuralgia; Vanlair finds it indicated particularly in neuralgias of the face and neck, and regards the existence of marked periodicity in the paroxysms as a leading indication for quinine.

It is better to give quinine in substance in a little water and made soluble by a drop of a mineral acid, than in pill form. If administered in an infusion of coffee, its bitterness is partly disguised. Graves reccommends the addition of a few drops of chloroform to the mixture, which is thus rendered more palatable.

SALICIN.

Salicin is a glycoside obtained from willow bark. It has been used in neuralgia chiefly on the recommendation of Dr. Maclagan. "The cases," he says, "in which I have found salicin to be of most service are those in which the pain comes on in periodic exacerbations, and in which quinine either fails

---

* *Lancet*, June, 1865, (quoted by Stillé.)
† Stillé, *Therapeutics and Materia Medica.*

to do good, or is for some reason inadmissible." He has given it chiefly in facial neuralgia. The dose must be large; twenty grains every three hours till eighty grains are taken, or till the pain subsides. (*Practitioner*, Nov., 1877, p. 321.)

IRON.

It is not surprising that iron, which occupies such a large place in the therapeutics of anæmia and debility, should be regarded as a remedy of prime importance in neuralgia, a disease of anæmia and debility; and, doubtless, as an adjuvant to good food, exercise in the open air, and other fortifying measures, iron may render important service in the treatment of neuralgia.

Anstie speaks highly of the tincture of sesquichloride of iron in the anæmic neuralgias. He thinks that besides its effects on the blood, it has a marked and direct influence on the nerve centres which is different from anything which one observes in the action of any other preparation of iron.* The effect which it produces in the anæmic neuralgias, more especially of young women, is something quite peculiar. He recommends the combination with strychnine, ten minims of the tincture of the chloride with one-fortieth of a grain of strychnine, and alludes to a severe case of frontal neuralgia that was markedly benefitted by this combination. (The dose is an exceedingly unpleasant one to take, and the tincture of iron doubtless has a deleterious action on the teeth).

Another favorite iron preparation is the saccharated carbonate, of which the dose is a scruple three times a day.

Hutchinson affirms that he has cured several cases of temporo-facial neuralgia by the sub-carbonate in large doses. A teaspoonful may be given of this red iron powder stirred into a little water, three times a day, The phosphate and pyrophosphate (especially the latter) are eligible preparations. In chlorotic patients with delicate stomachs the ammonio-citrate will sometimes suit better than any other form of iron.

Among the useful non-official preparations is the *elixir of phosphate of iron, quinia and strychnia;* dose, a teaspoonful three times a day; the *elixir of lactophosphate of iron;* the following formula of Dr. W. A. Hammond is a powerful tonic combination:

---

* *Anstie on Neuralgia*, Am. Ed., p. 229.

℞ Pyrophosphate of iron. ʒ i,
Quinine sulph., ʒ ss,
Strychnine, gr. j,
Acid phosphoric dilute,
Syrup of ginger, āā ℥ ij.
M. Dose, a teaspoonful three times a day.

CHLORIDE OF AMMONIUM.

Dr. Eben Watson has represented this drug to be an efficient remedy for neuralgia of the fifth pair of nerves, and he refers to two cases in which the pain ceased within a few minutes after it had been given.* Anstie also speaks favorably of its use in migraine.

The dose is 20 grains dissolved in a large quantity of water. Muriate of ammonia is a very disagreeable medicine to take. The addition of a little licorice renders it somewhat more palatable.

STRYCHNINE.

If nux vomica or strychnia has any efficacy in neuralgias, it is by improving the circulation of the blood and the tone and nutrition of the nerves on which it acts. It is principally in the facial neuralgias and in gastralgia that it proves beneficial. Anstie speaks of the utility of strychnia in "cardiac neuralgia," though he gives the precedence to arsenic.

The dose of strychnia would be from $\frac{1}{40}$ to $\frac{1}{20}$ grain, administered in pill form. The liquor strychnia may be given in doses of from 5 to 10 drops.

Of nux vomica, one grain of the powder, one-fourth grain of the extract, or five drops of the tincture may be given for a dose.

PHOSPHORUS.

The use of this drug is altogether empirical. It has been given in the pill form, each pill containing $\frac{1}{100}$ grain. The phosphorated oil is not a very eligible preparation, though it may be administered in capsules, each capsule representing one-sixtieth of a grain, to be taken after meals. Phosphide of zinc is an excellent form for the administration of phosphorus; pills $\frac{1}{15}$ grain; dose, one pill after each meal. Thompson in England, and W. A. Hammond in this country are the principal advocates of the phosphorus treatment of neuralgia.

---

* Stillé, Therapeutics and Materia Med., Vol. II, p. 829.

COD LIVER OIL.

There is no question as to the value of fatty foods in neuralgia, although patients are often averse to them, and many with delicate stomachs are unable to tolerate or digest crude fats in any form. The neuralgic, as a rule, are lean and anæmic. The appetite is poor and assimilation is imperfect, The pains from which they suffer are often the outcry of starved nerves for more blood and better blood. If we would do these patients good, we must do something besides alleviating the pain for the time being. They must be built up by generous diet of which flesh and fats form a considerable proportion. As nerve substance is composed chiefly of albumen and fat, we see the importance of an abundant supply of these materials in the food.

But what can be done in cases where the appetite is absent —where the stomach loathes the kind of food that is needed? As far as possible, all the resources of hygienic therapeutics must be called into exercise; pure air, out door exercise, mountain climbing, horseback riding, rowing, walking, gymnastics. Or if the patient be bedridden, massage and electricity may be tried, with feeding according to the Weir-Mitchell method. Such fats as can be assimilated must be taken: sweet cream, salad oil, above all, cod-liver oil. In addition to the ordinary fare, a cup of beef peptonoids between meals, and in the night time. If cod liver oil in its purity cannot be borne, possibly some of the emulsions may suit, especially that with malt extract.

"It is" says Anstie "surprising what can be done in in this way by perseverance and tact. * * * * Nothing is more singular than too see a girl who was a peevish, fanciful and really very suffering *migraineuse* brought to a state in which she will eat spoonful after spoonful of Devonshire cream, and at the same time lose her headaches, lose her sickness and develop the appetite of a day laborer."

IV. MODIFIERS OF THE NERVOUS SYSTEM. ANALGESICS—

ANTIPYRIN.

Of all the analgesic medicines which have ever been prescribed for the neuralgic affections, antipyrin seems to have been the most uniformly successful, as well as the most harmless. Not even opium or morphine can be excepted, for opium does not more speedily relieve pain than antipyrin in cases

for which the latter is adapted, nor are the effects more permanent; besides at what cost is the analgesia of opium sometimes obtained.

History.—Antipyrin was discovered in 1885 by Knorr, of Erlangen, Germany. It is one of the products of the destructive distillation of coal tar. Antipyrin is a derivative of oxymenthl quinizine, which is obtained by the reaction of acetacetic ether on phenylhydrazine; if to this oxymethyl quinizine there is introduced a new methylic group, methylated oxymethyl quinizine is obtained, to which Felehne gave the name of antipyrin. It is a grayish white powder, slightly bitter to the taste, and quite soluble in water. The chemical formula of antipyrin is $C_{20}H_{10}N_2O_2$.

The manufacture of antipyrin has unfortunately fallen into the hands of a monopoly, which has patented the name in all civilized countries; hence the price of this drug has been relatively high. It is not, however, maintained, that the process of its manufacture is in any sense a secret.

Physiological Action.—While antipyrin in large doses is speedily fatal to animals, producing convulsions both clonic and tonic, and paraplegia or general paralysis, in smaller, medium doses its action is characterized by diminution of the sensory perception, and reflex excitability.*

G. Sée, and Chouppe have demonstrated that antipyrin lessens the excito-motor properties of the cord, and that it is also a sedative to the cerebrum. This physiological action gives hints as to the *modus operandi* of its therapeutic action in cases characterized by sensory hyper-excitability.

We are not here concerned with antipyrin in its relation to fever, and those marked anti-thermic effects which make it perhaps our best antipyretic.

Therapeutic Employ.—After antipyrin had been for more than a year employed in fevers, it was found to be of prime utility in combating the element pain. Nor is it strange that a remedy which lowers fever-heat by depressing the activity of the heat centres, should do good in other conditions dependent on abnormal nervous activity. It was found to be of benefit in acute rheumatism, by alleviating the pains in the joints. Professor Germain Sée was one of the first to point out the analgesic properties of antipyrin in all other affections where pain is a predominant symptom. He reported a first series of

* Dujardin-Beaumetz, *Dictionnaire de Therapeutique.*

observations, fourteen in number, relative to pains of the head; of these, four were cases of facial neuralgia; six were obstinate cases of migraine; four were the headaches of growing children. In all, antipyrin caused the pains rapidly to cease.

A second series of observations pertained to eighteen cases of neuralgia or neuritis, and of muscular pains; to five cases of sciatica; to several cases of painful zona, of lumbago, etc. In all these, antipyrin proved efficacious.

Wolff has found antipyrin promptly beneficial in muscular rheumatism and pleurodynia; Ungar speaks favorably of its effects in hemicrania, and in those headaches which accompany ophthalmias; while Lepine and Germain Sée have found severe cases of the *douleurs fulgurantes* of tabes dorsalis amenable to the same remedy Professor Sée has also had good results from antipyrin in angina pectoris.

Otalgia (earache) has been treated with success by antipyrine (Gomprez), and lumbago, whatever be its origin, according to Germain Sée, gets well immediately after two subcutaneous injections of five grains of antipyrin, with forty-five grains taken internally.

In visceral pains (hepatic, nephritic, gastro-intestinal colic, uterine colic). Germain Sée has never known antipyrin to fail. His treatment is a hypodermic injection of fifteen grains, aided by fifteen grain doses by mouth four times a day for eight days. In painful dyspepsias, he associates antipyrin with bicarbonate of soda, eight grains of each, three times a day at meal times. In painful menstruation he gives a lavement containing fifteen grains of antipyrin.

Mode of Administration and Doses.—Antipyrin, being soluble, is readily administered in water, or in alcohol and water. Simple elixir is a good excipient. The dose is from ten to twenty grains. Ten or fifteen grains may be given every hour or two till six doses have been given. Antipyrin may be safely administered in hypodermic injections. Seven or eight grains are dissolved in one or two cubic centimitres of water, and the whole injected under the skin. A little smarting follows the injection, which soon passes off.

Antipyrin sometimes causes a scarlatiniform rash, which, however, is never serious. Now and then a little nausea or vertigo attends its medicinal use, but it never causes the depression and cyanosis which frequently attend the use of acetanilid.

TONGA.

Tonga is a new remedy for neuralgia, introduced to the profession by Sidney Ringer and William Murrell of London, in 1880, and obtained from the Fiji Islands. It has long been used by the South Sea Islanders for all cases of neuralgia. It is employed in the form of an alcoholic extract, in the dose of a teaspoonful every few hours. Its effects seem to be very similar to those of guarana. A good preparation of tonga is made by Parke, Davis & Co.

GUARANA—CAFFEINE.

Guarana, and its alkaloid, caffeine, are somewhat famous anti-neuralgic remedies. Guarana was first brought into notice about twenty years ago. It is the product of a Brazilian plant, the *Paullinia sorbilis*. Caffeine exists in guarana in the proportion of about 5 per cent. The discovery of caffeine in four plants belonging to separate natural families, namely: the coffee and tea plants, the Paraguay tea, and the Paullinia, is an interesting result of recent chemical investigations.*

Physiological Action.—Guarana and its alkaloid act much like tea, coffee, and cocoa, causing at first excitation, then diminution of the functions of the cerebrum and spinal cord. Beaumetz sums up the principal effects as follows:† 1, cerebral excitation; 2, complete paralysis of the sensibility; 3, tetanic spasms and convulsions; 4, death. "These poisons, then, seem to paralyze the posterior columns of the spinal cord, and the entire system of sensory peripheral nerves, having no action on the anterior columns and motor nerves."

These are the principal points of interest in connection with the anti-neuralgic uses of guarana and caffeine. It is evident that the analgesic action, which is the one sought for, cannot be dependent on the paralyzing action of the drug on the sensory nerves and centres, which follows large doses.

Therapeutic Uses.—It is especially in migraine that guarana or its alkaloid have proved beneficial. Nevertheless, facial neuralgia has proved amenable to its use, and the supra-orbital and infra-orbital headaches.‡ Common sick-headache, so generally referred to gastro hepatic derangement, is often marked-

---

* Wood & Bache, U. S. Dispensatory.
† Dujardin-Beaumetz, Dictionaire de Therapeutique.
‡ Vanlair, Loc. Cit.

ly relieved by guarana, and I have witnessed one case of cervico-brachial neuralgia, which for more than three years was kept in abeyance by this drug.*

Doses.—The dose of guarana is fifteen to thirty grains; that of caffeine, three to six grains. The former may be taken well stirred in a little warm water, as a wineglassful. The caffeine, which is generally given in the form of a citrate (the citrate is, however, merely a mechanical combination of caffein and citric acid, and not a true salt) may be taken in a spoonful of syrup, simple elixir, or water. The dose may be repeated in an hour or two if no result is derived from the first dose.

"I know," says Dujardin-Beaumetz, "a physician who infallibly cuts short his attacks of migraine by the use of one or two grammes of guarana." This has been a frequent experience. I personally know many (mostly delicate females) who were formally martyrs to nervous headaches, and who have for years been made comfortable by an occasional scruple dose of guarana, taken in time to ward off an impending paroxysm.

Dujardin-Beaumetz (*Dictionnairé de Therapeutique*, art. *Guarana*) gives the following directions for the administration of guarana: "If the attacks of migraine are frequent (several a month), take every morning two grammes of guarana, half an hour before breakfast,

"At the onset of an attack, or, better still, as soon as the precursory symptoms show themselves, take seven and one-half grains in a little sweetened water; wait a quarter of an hour, if the migraine is not gone, repeat the dose."

Formulæ:

℞ Fluid ext. guarana, ʒj.
Dose, a teaspoonful p. r. n.

The combination of caffeine and guarana is sometimes more efficient than either the one or the other alone:

℞ Guarana in fine powder, ℈j.
Citrate caffeine, gr. iij.

---

* *Med. Record*, 1876, page 743: "Dr. H. C. Perkins, the attending physician, had obtained a quantity of Paullinia from Brazil. * * * Some brilliant cures were wrought, and every form of neuralgia seemed to be controlled by the Paullinia powders. In the case of Miss R——, the good effects were especially marked. * * * Her general health improved. For four years there was almost complete immunity from the pain."

Make one powder. To take in a little water when precursory symptoms first appear. This dose will sometimes interrupt an attack that is in progress.

ANTI-NEURALGIC POWDER.—(Dujardin-Beaumetz.)

℞ Caffein, 0 gr. to 10 centigr.
White sugar, 0 gr. to 50 centigr.
M. One powder, p. r. n.

BAMBERGER'S ANTI-NEURALGIC POWDER.—

℞ Sulphate of quinine, 0 gr. to 50 centigr.
Citrate of caffein, 0 gr. 50 centigr.
White sugar, 5 grammes.
M. Divide in chart, No. vi. Sig.—Take four a day.

SYRUP OF CITRATE OF CAFFEINE.—(Hannon.)

℞ Cit. caffeine, 4 grammes.
Simple syrup, 120 grammes.
M. Sig.—A teaspoonful as often as indicated.

ACETANILID (ANTIFEBRIN).

The introduction of acetanilid into therapeutics is due to Cohn and Hepp, in 1886, who first made known its antithermic properties, and called it antifebrin. Acetanilid is obtained by the action of glacial acetic acid on anilin. It is a substance of a beautiful pearly white color, of slightly pungent, not disagreeable, taste. Very crystallizable. It is but very slightly soluble in water. Its chemical formula is C_8H_9NO.

Physiological Effects.—There is nothing in the physiological effects of this drug especially suggestive of the analgesic action which medicinal doses exercise in many forms of pain. It is true that large toxic doses are attended with abolition of sensibility, but it has not been shown that moderate doses are anæsthetic.

Therapeutic Action.—Analgesic Effects.—Dr. Demieville, of Lausanne, was one of the first to call attention to acetanilid as a nervous medicament.* He administered it with benefit in sciatica, lumbago, neuralgia, in headaches of various kinds, in pains of obscure origin, in dysmenorrhœa, and in the lightning pains of tabes.

---

* *Revue Medicale de la Suisse Remaide*, June 15th, 1887.

Since the communication of Dr. Demièville, multitudes of communications have appeared in the medical journals of Europe and this country on the subject. The general verdict may be stated as favorable to the use of acetanilid as an analgesic *wtihin a limtied range*. It is especially in hemicrania that it seems to do good. Some practitioners even seem to think it equal to antipyrin as an analgesic. The dose is about one half that of antipyrin, *i. e.*, ten grains, to be repeated three or four times a day. As acetanilid sometimes causes alarming cyanosis, even in medicinal doses, many practitioners are shy of it. A safe way of administration would be to give five grains every two hours till four or five doses are given. The dose may be given in capsules, stirred in water, or in simple syrup, or elixir simplex.

PHENACETIN.

Discovered in 1887 by Kast and Huisberg, the phenacetins are three in number: *Orthophenacetin*, *metaphenacetin*, and *paraphenacetin*. The general formula is as follows: $C_{10}H_{13}N.O_2$.

Orthophenacetin and paraphenacetin are medicinal.

Phenacetin, like antifebrine and antipyrine, is both antipyretic and analgesic; especially the latter.

As an analgesic, it has given good results in nervous headaches, migraine, neuralgia of the trigeminus, sciatica, and the lightning pains of locomotor ataxia. A dose of ten grains ordinarily suffices to allay pain; if this is not sufficient, another dose of five or ten grains may be with safety administered. Its hypnotic properties are also considerable.

Experiments made by Dujardin-Beaumetz in Cochin Hospital the past year have shown that the phenacetins possess great medicinal value, are but little toxic, and have all the properties of antipyrin, while being superior to the latter. He administers it in the dose of 7½ grains morning and evening, it being a matter of indifference whether ortho- or paraphenacetin be chosen.

Phenacetin is but slightly soluble; may be given in capsules or tablets, each containing seven grains. There need be no fear of any toxic action; Beaumetz has administered to animals as much as three grammes per kilogramme of the weight of the animal without causing death. Enormous doses, amounting in all to nearly two ounces, were given in the course of a little more than a fortnight to a patient suffering from tetanus, and recovery was attributed to the free use of

the medicament. There is another advantage which this medicament possesses over antipyrin and acetanilid, in being perfectly tolerated by the stomach. Its price is less than that of antipyrin, at the same time, it is more powerful in the same dose; in fact, one gramme of phenacetin produces an effect fully equal to that of two grammes of antipyrin.

Prof. Lepine has now employed phenacetin for several months as a "nervine medicament," with satisfactory results, and prefers it to antipyrin and acetanilid. Gaiffe has used it with advantage in the vomiting of phthisis, also in nervous polyuria. It has thus far had no effect in paralysis agitans and chorea, but it markedly benefits whooping cough.

Mœller, who has made much use of phenacetin in typhoid fever, states that it does not produce a durable and constant apyrexia; patients soon get accustomed to it, and, moreover, it has no effect on the course of the disease. This clinical authority prefers antipyrin and antifebrin as antipyretics, but finds phenacetin far superior as an analgesic. I may add that this has been my own experience.

Exalgin.

Still another compound of apparently considerable medicinal value (if we may trust the statements) has been obtained from one of the products of the destructive distillation of coal-tar. It has been experimented with by several members of the Academy of Medicine, who have reported favorably; and in consequence of its marked analgesic properties it has received the name exalgin.

At a late meeting of the Société de Thérapeutique, M. Bardet presented samples of this substance and made his report.

Exalgin represents, chemically, methylacetanilide, $C_9H_{11}N.O = C_6H_5C_2H_3ONCH_3$. From acetanilid three methyllic derivatives are obtained; one of these is the substance in question, and is designated Ortho-methylacetanilid It presents itself in the form of fine needles or large white tablets, is little soluble in cold water, more soluble in warm water, and very soluble in spirit and water. Administered to animals this substance acts energetically on the cerebro-spinal axis and speedily kills in the dose of 40 centigrammes per kilogramme of the weight of the animal. It causes restlessness and trembling, and the respiratory muscles soon become paralyzed. In a less dose all sensibility to pain disappears, and the temperature of the body diminishes gradually.

The physiological effects of exalgin are very similar to those of antipyrine, although the former seems to act in a more marked manner than antipyrin on the sensibility, and less energetically on the heat centres.

The analgesic effects of exalgin are obtained by a full dose of seven grains; in some instances it may be necessary to repeat this dose in a few hours. The relief from pain is more prompt and more lasting than when antipyrin is given; this is emphatically the case in all forms of neuralgia, especially in the visceral neuralgias. So far, no symptoms of gastric or intestinal irritation have been noted when exalgin has been given for its medicinal effects; its use has never been attended by cutaneous eruptions or by cyanosis.

Exalgin is eliminated by the urine, the excretion of which it seems to lessen in diabetic polyuria, at the same time that it diminishes the quantity of sugar in the urine.

ALCOHOL.

Neuralgic patients are often benefited by various alcoholic preparations in moderate, tonic doses, as an adjuvant to food and exercise. Wine, ale, and porter are the preferable forms; a small glass of Bass' English ale or Dublin porter promotes appetite and general invigoration. Alcohol is not to be used in neuralgia for its narcotic effect as a remedy for pain.

NITRO-GLYCERIN.

Nitro-glycerin has been recommended in some forms of neuralgia accompanied with pallor, a weak pulse, small, rigid radial artery, etc. Single drop doses of a one per cent. solution (glonoin) are given in cases of small pulse, but with a full pulse, the full effects cannot be produced with less than two-drop doses (Trussewitsch). When, on the other hand, headache and neuralgia occur in patients with chronic congestion of the subcutaneous veins of the face nitro-glycerin is to be avoided.* The condition in which it does the most good is one of failing circulation with atheromatous arteries and anæmia.

Nitro-glycerin seems to be an exciter of the vaso-dilator system of circulatory nerves, *i. e.*, granting that there are vaso-dilator nerves.

---

* *Lancet*, Feb. 19th, 1887, p. 384.

V. Local Treatment, etc. Electricity.

On account of the similarity of action between the electric current and the nerve current, it early occured to electro-therapeutists so employ electricity in neuralgic complaints, with the intent of modifying the molecular state of the nerves and restoring the physiological function. Faradism was at first almost the only mode put in use, and Duchenne de Boulogne was one of the first to make thorough trials of the interrupted current in the treatment of neuralgia. According to his reports, remarkable success attended these trials. Since that epoch, Faradization has given uncertain results and often complete disappointment in neuralgic affections, and is now seldom resorted to in the treatment of any form of neuralgia.

Faradization is believed to act as a particular mode of revulsion (Vanlair). Feeble Faradic currents are utterly inefficacious in neuralgia. In order, says Vanlair, that they may manifest their curative active, they must provoke painful impressions. This has been the experience of other authorities.

Mode of Application.—A Kidder, McIntosh, Fleming or Hall battery may be used, and a pretty strong current employed with frequent interruptions; the painful region to be electrized by the metallic brush. This is the method of "electric fustigation" employed by Duchenne and Tripier.

Becquerel recommended very strong and rapid currents. He advised the extra current and a wet sponge for electrode, and directed to apply the positive pole over the part of the nerve nearest the nerve centre, and the negative pole over the divisions of the nerve; to be passed to and fro. Seances of five minutes' duration.

Vanlair prefers the "dry excitator," which, corresponding to the negative pole, should be placed over the painful region, the other electrode, which may terminate in a moist sponge, is placed a little distance off The electrodes are not moved back and forth over the skin, *i. e.*, the current is *stabile*, and not *labile*. Seances of five to ten minutes. When the sedative action of the current is desired, the "moist excitators" are employed, the current is given a centrifugal direction (positive pole central, negative pole peripheral), and the seances are somewhat longer.

Galvanism.—All authorities are agreed as to the necessity of using mild currents. The negative pole is applied near the nerve centre, the positive pole may be moved over the different

painful points of the affected nerve.* When treating *tic douloureux*, the current should be very mild, and should not exceed three or four milliamperes.† In the case of sciatica, stronger currents are required, twenty milliamperes, and even more. The sittings should be short, though according to Apostoli, the duration of the seance cannot be fixed in advance, and the passage of the current should be continued till the pain disappears, or till at least some mitigation is obtained.

When there is a *point douloureux*, the positive pole may be applied over this point (Niemeyer, Bardet, Tripier, Apostoli). Static electricity is little employed in neuralgia, though recommended by Arthuis.

With regard to the choice of batteries when galvanism is indicated, those principally in use are the Daniell battery, the Gaiffe, the Bunsen, the Siemens-Halske, and the Leclanché battery.

Among the advantages of galvanism over faradism in neuralgia, are the following:

1. It is not painful, or scarcely at all painful.

2. It exercises a decidedly sedative effect when applied *secundum artem*. A notable depression of the sensibility and motility of the nerve follows.

3. It has the property of acting on the nutrition of the tissues in energizing the exchange of materials. This is the catalytic effect of the current, called *electrolysis*.‡

According to Eulenburg, sciatica, of all the neuralgias, is that which most readily yields to the constant current, while intercostal neuralgia, (so amenable, according to this authority to faradism) resists the action of the galvanic current.

Migraine, according to Dr. Joseph Stead,§ is almost always benefited by the constant current. He cites cases where a five minutes application of a galvanic current produced most gratifying results. The battery used was that of Weiss. He employed about eight cells with very small sponges (about as large as would fill the end of a thimble) soaked in warm water, and fixed to those small conical electrodes which are used for the localization of the current in paralysis of the interossei and lumbricales muscles. He ap-

---

* Dujardin-Beaumetz, *Clinical Therapeutics*, Am. ed., p. 59.
† Ib. loc. cit.
‡ Vanlair, loc. cit., p. 200.
§ Braithwaite's Retrospect, Part 65. page 86.

plied them over the painful region, keeping them about one inch apart, moving them about, but not removing them for two months. As soon as the pain ceases in a case of neuralgia, he makes it a rule to discontinue the application.

Dr. S. J. Knott, in *London Lancet*, Dec. 18th, 1875, reports several very interesting cases of sciatica cured by galvanism. He used eighteen cells of Stöhrers battery; séances three times a week.

Another writer who has made much use of galvanism in the treatment of neuralgia is Dr. J. Russell Reynolds, to whose valuable articles in the *Lancet* (2d part, 1870) we can only just allude. The same may be said of Dr. A. D. Rockwell, of New York, and Dr. Henry Lawson of St. Mary's Hospital, London.

MASSAGE.—KINESITHERAPY.

Kinesitherapy is the treatment of diseases by movement, and includes gymnastic exercises, Swedish movement, and massage.

One would never resort to the "movement cure" or massage during a neuralgic paroxysm, except so far as he might endeavor by gentle frictions or steady compression over the affected nerve or nerves to attenuate the pain. Sometimes such manipulations are attended with signal benefit, while on other occasions all pressure and movement aggravate the suffering.

Valleix has noticed that pressure diminishes certain neuralgic pains, and the authors of the Compendium of Medicine speak of facial neuralgias calmed by methodical compression over the trunk of the nerve.* In a recent publication, Gassenbaur relates two cases of rebellious neuralgia treated by massage.† The one was a sciatic, the other a crural neuralgia. From his own researches, Faye concludes that massage is advantageous in acute and well circumscribed idiopathic neuralgia, and notably in sciatica, facial neuralgia, and neuralgias of the perineal region. It has but a feeble action in migraine.‡

The Swedish treatment of neuralgia consists in deep kneading of the entire limb or portion of the body affected. Deep pressure, for instance, is made with one finger or thumb

---

* Vanlair, Loc. cit., p. 222.
† Vanlair, Loc. cit., p. 222.
‡ Cited by Vanlair.

on the nerve at the seat of pain, which causes an intense pain for the moment, but is followed by a sort of paralysis of the same nerve, lasting for several hours. In neuralgic affections of the ulnar, percussion is made along this nerve from its origin to its termination. "The blows should be sharp and short if the pain is a dull, heavy ache, and of the character of a slow heavy pressure if the pain is acute. For instance, in facial neuralgia, paralyze the trigeminus trunk to cut off its sensation, then knead and percuss with the finger tips."

Minute directions after this pattern are given in many treatises; it is not, however, probable that massage will ever have a wide field of usefulness in the treatment of neuralgia. Much more can be expected of gymnastics in the prophylaxis of neuralgia, for the exercises included under this head have a directly fortifying effect on the general muscular system, on the nerves and nerve centres. Besides, as Anstie points out, gymnastics not only improve the circulation and general nutrition, including the nutrition of the nervous centres, they also give the nervous centres an education by the variety of difficult co-ordinative movements over which it trains those centres to preside.*

COUNTER-IRRITATION.—REVULSIVES.

In my judgement, counter-irritants (as mustard, turpentine, acetic acid, oil of cajeiput) have not a very important place in the therapeutics of neuralgia. I have never seen a severe case of intercostal, cervico-brachial, sciatic or other pure neuralgia much relieved by a mustard plaster or a turpentine stupe, I believe that it is in rheumatoid pains and in myalgia that these applications principally do good. Severe revulsion by vesicants, the actual cautery, the thermo-cautery, has, however, in many severe forms of chronic neuralgia been productive of benefit.

I remember a bad case of cervico-brachial neuralgia where pustulation by tartar emetic ointment over the upper part of the spine caused a marked postponement of the ordinary attacks. In sciatica, I have occasionally seen good from blisters applied along the nerve, over the seat of pain.

Latterly, the chloride of methyl spray has proved the most efficacious means of treating sciatica. A peculiar appara-

* Anstie, on Neuralgia, Am. Ed., p. 275.

tus is required for these pulverizations, which produce intense cold, followed by marked revulsion. A description of this process will be found in New Medications, Am. Ed., page 283.

Cauterizations have been employed in very obstinate cases. Legroux was in the habit of employing sulphuric acid in the treatment of sciatica; with a stick soaked in the strong acid, he marked out on the painful member the branches of the sciatic nerve. At the present day, the hot iron, and especially the Paquelin cautery are used; with this cautery, points are made all along the nerve. Acupuncture is another means of revulsion, now, however, pretty much gone out of vogue. The same may be said of *Baunscheidt's réveilleur de la vie*, a little apparatus consisting of a bunch of pins, made to penetrate the skin by a spring; these pins were generally dipped in croton oil before using the instrument.

Dujardin-Beaumetz* refers to the benefits sometimes derived from electro-puncture, as performed with the condenser of Planté appropriated by Trouvé to medical practice. With a wire heated to a red heat by electricity, points are made to the depth of a half a centimetre. and some little distance apart, over the tract of the affected nerve. The punctures are followed by considerable inflammation, but they often bring the greatest relief to the patient.

HYPNOTIC SUGGESTION.

Of late many remarkable cures have been claimed by hypnotic suggestion. The subject is thrown into the hypnotic or mesmeric sleep, and the suggestion is repeatedly made till it proves to be a reality that the pain is all gone. Bernheim has related in his book: "*De la Suggestion et de ses applications à la thérapeutique*" facts of this kind. The pain of migraine, sciatica, pleurodynia, etc., has been caused to disappear by a profound impression made on the sensory nerve centres of the subject. It would appear that under hypnotism the higher cortical centres are dormant, and that in a certain proportion of cases, the functional activity of sensori-motor ganglia that are in a state of morbid irritation may be suspended by suggestion. But the *modus operandi* of the process is involved in profound obscurity.

---

* Clinical Therapeutics, Am. Ed., p. 66.

NERVE STRETCHING.

Nussbaum was the first to practice nerve stretching: Billroth about the same epoch (in 1872) performed this operation. It has since been performed in England, Germany, France, and America. From Chauvit's article ("On Nerve Stretching," Arch. Gen. de Med., 1881, p. 701–710) we ascertain that in 1881 nerve stretching has been employed in fifty-two cases of neuralgia, as follows:

Neuralgia of the face	14
Intestinal neuralgia	2
Neuraigias of the upper extremities	9
Neuralgias of the lower extremities	27

In these fifty-two cases of neuralgia there were thirty complete cures, twelve cases where there was marked amelioration, and ten failures.*

According to Dujardin-Beaumetz, the benefits obtained in some instances from nerve stretching may be thus explained: It is probable that "the stretched nerves have a reactive influence on the sensory spinal centres which favorably modifies the molecular state of the cells; this view receives support from the fact that very powerful tractions do the most good." The elongation does not act by causing a solution of continuity in the nerve fibres. In fact, according to the observations of Davalt, the sensibility returns at the end of twenty-four hours, which would not be possible were there a rupture of the nerve filaments.

In one of Cox's cases the ulnar nerve was stretched for a traumatic neuralgia; the operation resulted in a cure. Both supra-orbital and infra-orbital nerves have been stretched for obstinate pain located in their tracts, and other branches of the fifth nerve have been stretched, with variable results. Sciatica has been sometimes benefited by the operation.

The nerve is cut down upon in the most exposed place, lifted out with the forefinger and pulled upon with a force of forty to fifty pounds.

NEUROTOMY.

Neurotomy was performed for the first time by Marichal, more than a century ago, for neuralgia, and has since been repeated in a multitude of instances.

---

* *Clinical Therapeutics*, Am. Ed. (Detroit), p. 63.

It cannot be denied that marked relief has in many cases been obtained by simple section of painful nerves, though the results are generally temporary and disappointing. That this is likely to be the case is apparent from the following considerations: 1. It may be difficult, if not impossible, to reach the suffering nerve when it is situated deeply. 2. The seat of the pain may really be central and not peripheral. The sensory, cortical, ganglia may be affected, and the pain *referred* to the peripheral branch; in this event section of the nerve might fail in any way to modify the encephalic centre, although some brilliant results have been recorded from neurectomy in cases where the neuralgia was of purely centric origin. Here the strong peripheric stimulus of the operation has acted as an energetic nervous alterant. Instances of this kind are recorded by Erb in Ziemssen's Cyclopædia, Vol. XI., page 95. 3. Another objection to nerve section is the trophic disturbances which are likely to follow; this is especially the case when a mixed nerve has been severed.

On account of the partial and fleeting success which has attended neurotomy, the favorite operation is now:

NEURECTOMY.

Here a portion is exsected from the painful nerve. Repair eventually takes place, and the nerve resumes its functions, but respite from pain for a considerable time is obtained, and during the period of formation of new nerve tissue and re-establishment of conduction by union of the divided nerve ends, it is hoped that restoration of the normal condition in the diseased focus may be established.

Neurectomy is hardly practicable except in neuralgias of the trigeminus, and not more than about two centimetres of the diseased nerve ought to be excised.

Neurectomy of the fifth nerve was performed more than fifty years ago by the late Dr. Joseph Pancoast, of Philadelphia, who was the first to reach the interior maxillary nerve by sawing through the condyle, and to cut it close to the foramen ovale. Dr. W. H. Pancoast, son of the former, has made several exsections of the sciatic and crural nerves in obstinate neuralgias. Neurectomy of these latter nerves, however, is generally considered a dangerous and unsatisfactory operation as they are mixed nerves, and both trophic and motor paralyses are sure to follow the operation. Hooker practiced exsection of the popliteal in one desperate case; for three months there was absence of all pain.

Dr. Maurice H. Richardson, of the Massachusetts General Hospital, has practiced exsection of the inferior dental nerve with brilliant results. This nerve is comparatively easy of access. In 1876 the first operation for avulsion and destruction of the whole nerve was performed, and this operation has been several times repeated since then. The buccal nerve has been in several instances divided where it comes out over the buccinator, and the superior maxillary nerve has been exsected in the floor of the orbit. Dujardin-Beaumetz alludes to a case occurring under his care in St. Antoine Hospital.* The patient was a sufferer from tic douloureux. All medical means had been unavailing. It was an infra-orbital neuralgia. Beaumetz advised resection of the upper maxillary nerve; the operation was performed by Terrillon. The nerve was sought at its point of emergence from the foramen, and followed into the floor of the orbit; the terminal portion of the nerve to the extent of three centimetres was excised. Two years had elapsed at the time of the writing; the pain had never returned.

But the operation is seldom so successful, and, as Beaumetz remarks, many instances are on record where branches of the trifacial have been resected for painful affections, and with the utmost skill and thoroughness, with no result but aggravation of pain to the patient and mortification to the surgeon. This, as before said, is especially apt to be the case where the pain is central; and it must be remembered, too, that much of the neuralgia that one ordinarily sees is constitutional or dyscrasic, *i. e.*, due to morbid alterations of the blood; it is not to be expected that such neuralgias would be materially benefited by any operation on the nerves.

HYDROTHERAPY.

Doubtless the external action of cold water in the form of douches, jets, the shower bath, the cold plunge, sea bathing, is of prime utility in toughening the integument and strengthening the peripheral nerves of neuralgic persons. Fleury has applied with success the cold douche to recent trifacial, intercostal, and sciatic neuralgias. He has seen the pain disappear after two or three treatments. Intercostal neuralgia is the most amenable to the cold douche. He records that the first applications are likely to exasperate the pains, but perseverance brings its reward.

---

* *Clinical Therapeutics*, Detroit ed., page 62.

At the hydrotherapic establishments there is a variety of appliances for cold water treatment (*douche en jet mobile, douche en lame, douche en pluie, douche en cercle, etc.*), all of which must be dispensed with in private and ordinary hospital practice. It has not even been proved that the wet pack is of any utility in the neuralgias of the trunk or viscera.

It would appear that the principal benefit to be derived from hydrotherapy is of a prophylactic kind, and that the cold douche is principally of use (like cold bathing and sea bathing) in strengthening weak organisms.

Nevertheless, some authorities (notably Baruch) speak in unqualified terms of the benefits of hydropathy in various forms of neuralgia. Baruch has found it especially serviceable in sciatica. The patient is wrapped in a dry woolen blanket; pieces of old woolen blanket two and four feet, doubled, are wrung out of hot water by means of a wringer. These, after liftfng the blanket, are applied to the affected limb over the region of the nerve, and are rapidly changed till the parts become thoroughly congested and the patient is bathed in perspiration. This treatment is kept up about half an hour. In chronic cases the general tonic treatment by cold ablutions, douches, and plunges is indicated.

OSMIC ACID.

Osmic acid is a tetroxide of osmium. It is colorless, solid, crystallizable in long, brilliant, flexible prisms, melts at 40° C. and volatilized at 100° C. It exhales a very pungent horseradish odor, and its vapors are very irritant.

This substance was first introduced into the therapeutics of neuralgia by Eulenberg, who treated with success certain neuralgias by hypodermic injections of osmic acid, a one per cent. solution in distilled water. He found that the injections of the above strength caused no unpleasant symptoms. He selected twelve cases of neuralgia in different cutaneous nerve districts of the upper and lower extremities of the head and body; most of these were fresh and not unusually severe cases. The treatment extended over one to six weeks; the number of injections in individual cases was from three to fourteen. The amount injected was a half a gramme of the solution; the injection was made into the diseased part. Of twelve cases three were cured, four more or less relieved; five were not benefited.

More recently, Shapiro, of St. Petersburg, has reported success with the subcutaneous use of osmic acid in facial neuralgia. The commencing dose was five drops. He had not observed any evil local effects from these injections. He remarks that the most important action of the drug is to cause inflammation of the terminal nerve branches, its narcotic effect being of a secondary nature only.

Dr. G. W. Jacoby, of New York, claims to have treated eighteen cases, mostly of sciatica, by these injections, eight of which were cured, and some others benefited.

Dr. Merces (*Lancet*, Jan. 10th, 1885) reports having tried osmic acid in eighteen cases of sciatica. The patient's ages varied from eighteen to sixty-five. In twelve cases, he succeeded in giving absolute relief for a period of three weeks, when he lost sight of them. In six he gave temporary relief. The injections were as many as twelve in one case. He says that although he gave these patients no permanent relief, they obtained more comfort from the osmic acid than from even hypodermic injections of morphine. He used a one per cent. solution, injecting from three to five minims deeply over the sciatic nerve. At the seat of the puncture the patient complained of a numb feeling, which, however, was transient. In some cases the effect was marvellous, the patient being able after a short time to stand on the affected leg, a feat which he had been unable to do before for years. He thinks the effects are "undoubtedly local," but does not believe that it exerts its action by setting up an inflammation, but rather by a narcotic effect.*

VERATRIA.

There is some testimony in favor of veratria ointment, as an adjunct to other treatment, in migraine, supra-orbital and intercostal and other neuralgias. Anstie has seen it do much good in mammary neuralgia.

The following preparations are in vogue:

POMMADE CONTRE NEURALGIES.—(Bertrand.)

Veratrin, 0 gramme 30 centigr.
Muriate of morphia, 0. gramme 20 centigr.
Glycerite of starch, 30 gr,

M.

---

* Dujardin-Beaumetz, *Dict. de Thér.* Art.; Osmic Acid. *Bull. de Thér.* t. Cx, p. 188; Lancet, July 25th, 1885; p. 167. Medical Record, Vol. xxvii; p. 713.

POMADE DE VERATRIN.—(Dujardin-Beaumetz.)

Veratrin, 0. gramme. 05 centigr.
Axunge, 10.

M.

VERATRIA OINTMENT.—

Veratria, ℈i.
Lard, ʒi.

M. For ordinary use in neuralgia this ointment should be diluted with as much, or twice as much, lard.

PHENIC ACID IN HYPODERMIC INJECTIONS.

Recently Baccelli (Semaine Medical, 1888, p. 422, and 1890, p. xxiv.) has lauded the use of phenic acid in subcutaneous injections in neuralgias in general, and particularly in sciatic, supra-orbital, and intercostal neuralgias. In the Semaine Medical for February 6, 1890, he reports a case of tetanus cured by this means. Baccelli employs a 1 per cent. solution of phenic acid; the injections are made over the seat of pain. The injections are repeated every hour till relief is obtained; at first one-sixth grain of the active substance, then two-sixths, by injection. According to this writer, the efficacy of phenic acid is due to the sedative action which this medicament exerts on the excitability of the nervous centres. But little pain or smarting follows these injections.

CONCLUSION.

The medical student and the junior practitioner who know little of neuralgias except what they have learned in books, may imagine from the above formidable list of remedies that with such a therapeutic arsenal they may easily triumph over every form of pain. Alas! how soon will they find their mistake! This very abundance of therapeutic resources shows the intractableness of the painful neuroses. It were to be wished that we had fewer medicaments, and better.

At the same time, the medical profession is far better able to cope with diseases, whose principal element is pain, at the present day than ever before in the past. Think of the physician of former times, with no analgesic medicines but crude opium and other narcotics; without any knowledge of the surgical means!

Since the last edition of Anstie's work (October, 1871) and that of Vanlair (1882), all the so-called analgesics (antipyrin, exalgin, acetanilid, etc.), have been discovered; cocaine has come into general use as a local anæsthetic; several new and valuable hypnotics (paraldehyd, sulphonal, chloralamid, etc.) have been introduced; hypnotic suggestion has been brought into prominence, and has won some triumphs in the realm of obstinate neuralgias, and Hygienic therapeutics, which includes massage, gymnastics, the Swedish movement cure, hydrotherapy, aërotherapy, climatotherapy, dietetics, etc., have undergone considerable development.

Yet, despite progress in neurology, in pathology, in therapeutics, the physician must still often find himself powerless before a stubborn case—powerless to contend against the forces of heredity, powerless to right an organism that has always been wrongly constituted.

It is to be lamented that we have not more precise indications as to the uses of most of the drugs mentioned above, whose employment must be still largely empirical. Nor can it yet be said that we have for the various forms of neuralgia certain specifics on which we can depend, so that one may affirm that in this kind of pain phenacetin is especially applicable, in that acetanilid, etc. The physician will often be compelled to feel his way along by the help of somewhat vague lights, and no text-book or treatise can do more than give him hints which he may tentatively apply to each particular case.

INDEX.

B.

C.

Page.

J.

K.

L.

M.

N.

Page.

S.

T.

V.

W.

Z.

Eligible Remedies for Neuralgia.

Among the many remedies that are commended for Neuralgia, we may mention for internal and local application the following, which we supply:

FOR INTERNAL ADMINISTRATION.

Brown-Sequard's Neuralgic Idiopathic Pills—

Ext. Hyoscyamus, 2-3 gr.	Ext. Conium fruit, 2-3 gr.
Ext. Ignatia, 1-2 gr.	Ext. Stramonium seed, 1-5 gr.
Ext. Opium, 1-2 gr.	Ext. Aconite leaves, 1-3 gr.
Ext. Belladonna, 1-6 gr.	Ext. Cannabis Indica, 1-4 gr.

Neuralgic Idiopat., Brown-Sequard's, Half Strength.

Dr. Gross' Neuralgic Pills—

Quinine sulph., 2 gr.	Ext. Aconite leaves, 1-2 gr.
Morphine sulph., 1-20 gr.	Strychnine, 1-30 gr.
Arsenious Acid, 1-20 gr.	

Neuralgic, Without Morphine, Dr. Gross'.

Cerebral Sedative Compound.—A scientific substitute for certain copyrighted preparations in the market. The active constituents are potassium bromide, chloral hydrate, gelsemium and opium. The formula is published on each bottle.

We also prepare a Sedative Compound, Formula "B," which differs from the last named preparation only in the substitution of henbane for the opium in the regular formula.

Fl. Ext. Guarana, U. S. P.—Guarana contains from 4 to 5 per cent. of caffeine, a larger proportion than is found in any other drug. Moreover, the caffeine exists in this drug in a very soluble form, so that its action is very prompt, and the effect is greater than that produced by an equivalent quantity of the pure alkaloid. As a remedy in sick-headache guarana has no rival. It may be employed wherever caffeine is indicated.

FOR LOCAL APPLICATION.

Menthol, Genuine Japanese, in Crystals.—A camphoraceous substance derived from the Japanese plant, Mentha arvensis. It is employed for the relief of neuralgic pains, headache, toothache, etc., and is said to be valuable as an antiseptic inhalation in acute or infusorial catarrh. It is an agreeable medicine, and makes an acceptable substitute for the ordinary smelling salts. Its properties require it to be kept tightly enclosed to prevent rapid volatilization.

Menthol Pencils.—Put up in neat turned wood boxes, each one containing a pencil. These pencils greatly facilitate the local application of Menthol.

PARKE, DAVIS & CO.,

DETROIT AND NEW YORK.

IN EXPLANATION

OF

The Physicians' Leisure Library.

We have made a new departure in the publication of medical books. As you no doubt know, many of the large treatises published, which sell for four or five or more dollars, contain much irrelevant matter of no practical value to the physician, and their high price makes it often impossible for the average practitioner to purchase anything like a complete library.

Believing that short practical treatises, prepared by well known authors, containing the gist of what they had to say regarding the treatment of diseases commonly met with, and of which they had made a special study, sold at a small price, would be welcomed by the majority of the profession, we have arranged for the publication of such a series, calling it **The Physicians' Leisure Library.**

This series has met with the approval and appreciation of the medical profession, and we shall continue to issue in it books by eminent authors of this country and Europe, covering the best modern treatment of prevalent diseases.

The series will certainly afford practitioners and students an opportunity never before presented for obtaining a working library of books by the best authors at a price which places them within the reach of all. The books are amply illustrated, and issued in attractive form.

They may be had bound, either in durable paper covers at **25 Cts.** per copy, or in cloth at **50 Cts.** per copy. Complete series of 12 books in sets as announced, at **$2.50,** in paper, or cloth at **$5.00,** postage prepaid. See complete list.

PHYSICIANS' LEISURE LIBRARY

PRICE: PAPER, 25 CTS. PER COPY, $2.50 PER SET; CLOTH, 50 CTS. PER COPY, $5.00 PER SET.

SERIES I.

Inhalers, Inhalations and Inhalants.
By Beverley Robinson, M. D.

The Use of Electricity in the Removal of Superfluous Hair and the Treatment of Various Facial Blemishes.
By Geo. Henry Fox, M. D.

New Medications, in 2 Vols.
By Dujardin-Beaumetz, M. D.

The Modern Treatment of Ear Diseases.
By Samuel Sexton, M. D.

The Modern Treatment of Eczema.
By Henry G. Piffard, M. D.

Antiseptic Midwifery.
By Henry J. Garrigues, M. D.

On the Determination of the Necessity for Wearing Glasses.
By D. B. St. John Roosa, M. D.

The Physiological, Pathological and Therapeutic Effects of Compressed Air.
By Andrew H. Smith, M. D.

Granular Lids and Contagious Ophthalmia.
By W. F. Mittendorf, M. D.

Practical Bacteriology.
By Thomas E. Satterthwaite, M. D

Pregnancy, Parturition, the Puerpera State and their Complications.
By Paul F. Mundé, M. D.

SERIES II.

The Diagnosis and Treatment of Haemorrhoids.
By Chas. B. Kelsey, M. D.

Diseases of the Heart, in 2 Vols.
By Dujardin-Beaumetz, M. D.
Translated by E. P. Hurd, M. D.

The Modern Treatment of Diarrhoea and Dysentery.
By A. B. Palmer, M. D.

Intestinal Diseases of Children, in 2 Vols.
By A. Jacobi, M. D.

The Modern Treatment of Headaches.
By Allan McLane Hamilton, M. D.

The Modern Treatment of Pleurisy and Pneumonia.
By G. M. Garland, M. D.

Diseases of the Male Urethra.
By Fessenden N. Otis, M. D.

The Disorders of Menstruation.
By Edward W. Jenks, M. D.

The Infectious Diseases. In 2 vols.
By Karl Liebermeister.
Translated by E. P. Hurd, M. D.

SERIES III.

Abdominal Surgery
By Hal C. Wyman, M. D.

Diseases of the Liver.
By Dujardin-Beaumetz, M.D.

Hysteria and Epilepsy.
By J. Leonard Corning, M. D.

Diseases of the Kidney.
By Dujardin-Beaumetz, M. D.

The Theory and Practice of the Ophthalmoscope.
By J. Herbert Claiborne, Jr., M. D.

Modern Treatment of Bright's Disease.
By Alfred L. Loomis, M. D.

Clinical Lectures on Certain Diseases of Nervous System.
By Prof. J. M. Charcot, M. D.

The Radical Cure of Hernia.
By Henry O. Marcy, A. M., M. D., L. L. D.

Spinal Irritation.
By William A Hammond, M. D.

Dyspepsia.
By Frank Woodbury, M. D.

The Treatment of the Morphia Habit.
By Erlenmeyer.

The Etiology, Diagnosis and Therapy of Tuberculosis.
By Prof. H. von Ziemssen.
Translated by D. J. Doherty, M. D.

SERIES IV.

Nervous Syphilis.
By H. C. Wood, M. D.

Education and Culture as correlated to the Health and Diseases of Women.
By A. J. C. Skene, M. D.

Diabetes.
By A. H. Smith, M. D.

A Treatise on Fractures.
By Armand Després, M. D.

Some Major and Minor Fallacies concerning Syphilis.
By E. L. Keyes, M. D.

Hypodermic Medication.
By Bourneville and Bricon.

Practical Points in the Management of Diseases of Children
By I. N. Love, M. D.

Neuralgia.
By E. P. Hurd, M. D.

Rheumatism and Gout.
By F. Le Roy Satterlee, M. D.

Electricity, its application in Medicine.
By Wellington Adams, M. D.

Taking Cold.
By F. H. Bosworth, M. D.

Auscultation and Percussion.
By Frederick C. Shattuck, M. D.

Series IV will be issued one a month, beginning with November, 1889.

GEORGE S. DAVIS, Publisher,
P. O. Box 470. Detroit, Mich.